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ON GLYCERIN.

By Hennell Stevens.

(An Inaugural Essay.)

Glycerin, in its chemical habitudes, bears many analogies to the alcohols, but also presents phenomena which are apparently irreconcilable with such a view of its chemical relationship. The experiments which this essay is intended to detail, were undertaken with a view of throwing some light upon the subject, that others, more skilled than myself, might determine its true character and assign its real position as a chemical substance.

Glycerin, $C_6 H_8 O_6$, is now admitted to be the hydrated oxide of the hypothetical radical Glyceryl, $C_6 H_7$. According to this view of its composition it corresponds with alcohol, with which it also agrees in uniting with sulphuric acid. Sulpho-glyceric acid, the resulting compound, in its salts, very much resembles the corresponding salts of sulpho-vinic acid.

Sulpho-glyceric acid, on being heated, froths up very much, and emits fumes of sulphurous acid, leaving in the retort a thick reddish liquid smelling strongly of sulphurous acid. Several experiments were tried, with a view of detecting any ethereal compound which might be produced during the re-action, but they all failed to show any evidence of the existence of such a product. The more immediate object of the author had been to prove the existence of a series of ethereal compounds having glyceryl as their base. It would, in my estimation, afford a more satisfactory explanation of the composition of the fatty bodies, stearin, olein, &c., by supposing them to be compound ethers of the glyceryl series, than by the method generally adopted of considering them as salts of glycerin. This theory is strengthened by the fact that in stearin and olein, and perhaps in others of the same nature, we can substi-

tute ether for the oxide of glyceryl without any change in the constitution of the compound.

Distilled with acetate of potash and sulphuric acid, glycerin yielded a solution of formic acid of sp. gr. 1.075, contaminated with a substance giving it an extremely pungent odor. To determine the nature of this latter substance, the distillate was saturated with carbonate of soda and re-distilled. The product thus obtained, which had still an acid re-action, was again saturated with carbonate of soda and finally rectified from chloride of calcium. This yielded a liquid heavier than water, nearly colorless, neutral to test paper, miscible in all proportions with alcohol and ether, not inflammable, and having an extremely penetrating and powerful odor, and an acrid, burning taste remaining on the tongue for a long time. The quantity obtained was too small, and not of sufficient purity for analysis.*

All attempts to obtain an acid peculiar to the glyceryl series were unsuccessful, resulting uniformly in the production, either of formic acid alone, or a mixture of formic and acetic acids. As the experiments were unsuccessful, it is not deemed necessary to detail them.

The recent discoveries of the artificial formation of the flavors of various fruits as being due to the existence in them of different ethereal compounds, render the subject of the etherification of glycerin one of peculiar interest. It being a compound so widely diffused throughout the vegetable and animal kingdoms, all the fixed oils and the fats, with the single exception of cod-liver oil, having glycerin as a constituent, it is not impossible that various natural products, which agree in their composition with different compounds of oxide of glyceryl, may in reality be produced by the decomposition of glycerin under the influence of the vital force, and therefore may be produced by artificial means. Mannite, for example, has the same composition as oxide of glyceryl, and other natural products might be cited, which have a similarity of constitution. The artificial imitation of the results of natural processes, offers a field full of promise to the experimental inquirer, and among the

[* This substance is *acrolein*, and is best obtained by the dry distillation of sulpho-glyceric and phospho-glyceric acids. (See Regnault's Chemistry, p. 670.) The reader is referred to a paper at page 357 for some interesting results on the subject of glycerin.—EDITOR.]

substances which appear most likely to repay a full investigation, glycerin is certainly not the least promising. A want of time and apparatus prevented me from pushing my researches as far as I could have wished, but my experiments, although unsuccessful in proving the correctness of my suppositions, have only given me a firmer belief that they will yet prove to be in accordance with facts.

ON PILLS OF SULPHATE OF QUINIA.

By Edward Parrish.

Although it is not always left to the discretion of the apothecary, what excipients to employ in compounding prescriptions, yet he should be so familiar with the subject as to be able to advise and instruct medical men in regard to those which are really most advantageous in the case of each of the leading remedies extemporaneously prescribed. There are few intelligent apothecaries who have not a salutary influence in modifying the views of neighboring practitioners in regard to the art of prescribing, and none who have not frequent occasion to exercise their own judgment, not only in the selection of excipients, but in other practical points in extemporaneous pharmacy.

There is, I believe, no medicine so frequently prescribed in the pilular form as the sulphate of quinia, and perhaps none, in making which into pills, there is so great a diversity of practice. The following substances are much employed as excipients for this object: Gum arabic, simple syrup, syrup of gum arabic, honey, molasses, conserve of roses, crumb of bread, flour, and simple water; and besides these, tannic acid, extract of cinchona, and various tonic, astringent and narcotic extracts, which assist, or in some way modify the effect of the alkaloid to meet particular indications in disease.

Most pharmaceutists and medical practitioners have no doubt a preference for one or other of these, and, as is well known, there are in standard works several formulæ indicating similar preferences.

Dr. Pereira directs the pills to be made with conserve of roses, and in the three formulæ given in Pharmacopée Universalle, crumb of bread, honey and conserve of roses, are directed. Dorvault directs in L'Officine, for disulphate, the extract of wormwood; for the acid sulphate, conserve of roses. The pills are not officinal in

either of the British Pharmacopœias. In our own officinal directions, in the edition of 1850, gum arabic and honey are prescribed, while in that of 1840 gum arabic and syrup were the excipients.

The use of gum arabic and syrup was abandoned on account of the pills becoming insoluble by keeping. Gum arabic and honey used together are probably less objectionable. The omission of the gum entirely is perhaps an improvement, honey answering the purpose alone. As quinine is now more frequently prescribed in 2, 3 and 5 grain doses than in the one grain dose that used to be given, it is a desideratum to use an excipient which will produce the smallest possible increase of bulk at the same time that it gives a plastic mass.

The following formula is, I think, preferable to those in which gum arabic is employed, as well for the diminutive size as for the increased solubility of the pills:

Take of sulphate of quinia 12 grains.
Powdered tragacanth 1 grain.

Triturate the powders thoroughly together, and add sufficient water to form a plastic mass. Divide this into the required number of pills. Made in this way a three grain pill is not inconveniently large.

The use of simple water as an excipient is, I am told, common in domestic practice in the Southern States. The mass produced in this way possesses too little adhesiveness to render it satisfactory. Tannic acid has been used of late with a view to diminishing the intense bitterness of the quinine, but has not found favor generally, as far as my observation has extended. How far the known insolubility of the tannate of quinia in water should operate against this combination is a question for the therapeutist. Conserve of roses, in addition to its bulk, may be objectionable in this as in some other cases, on the score of containing tannic acid, which it does when made from Rosa gallica.

The following formula I have used for several years with great satisfaction to myself and to those physicians who have prescribed it. It was first suggested by a southern *medical student.*

Take of sulphate of quinia, 20 grains.
Aromatic sulphuric acid, 15 drops.

Drop the acid into the sulphate of quinia on a tile or slab, and triturate with a spatula until it assumes a pilular consistence;

then divide into the required number of pills. Made in this way, a five grain pill is not inconveniently large.

Although the ingredients when mixed form a fluid, they soon thicken into a paste, and finally become quite solid, and so adhesive as to be readily divided and rolled into pills; care must be taken not to allow the mass to become too dry and brittle before dividing it, as it is liable to do if allowed to remain too long.

In this form a portion of the disulphate being converted into the soluble neutral sulphate, the preparation more nearly resembles the solutions in composition, and is believed to be more rapid and certain in its action.

When it is desired to incorporate other substances in powder with the quinine thus prepared, they should be added to the mass when it is just so soft that, upon their addition, it will immediately assume the proper consistence.

It is not, however, advisable to employ this process when any considerable quantity of other ingredients are prescribed with the quinine, unless a little syrup or honey is also added to prevent the too rapid hardening and consequent crumbling of the mass.

LINIMENTUM ACONITI RADICIS.

By William Procter, Jr.

Take of Aconite Root in powder	four ounces,
Glycerin	two fluid drachms,
Alcohol a sufficient quantity.	

Macerate the aconite with half-a-pint of alcohol for twenty-four hours, then pack it in a small displacer and add alcohol gradually until a pint of tincture has passed. Distill off twelve fluid ounces, and evaporate the residue until it measures twelve fluid drachms. To this add two fluid drachms of alcohol and the glycerin, and mix them.

Remarks.—This preparation is intended as a substitute for aconitia as an external anæsthetic application. It is used in the following manner. Cut a piece of lint or muslin of the size and form of the part to be treated, lay it on a plate or waiter, and by means of a camel's hair brush saturate it with the *liniment*. Thus prepared it should be applied to the surface, a piece of oiled silk laid over and kept in place by an adhesive edge, or by a bandage.

The object of the glycerin is to retard evaporation after application to the skin, and the oiled silk is also used with this view. This preparation is twice the strength of the root, and is exceedingly active. It should not be applied to an abraded surface, and in its use the patient should be cautioned in relation to its poisonous nature, and avoid bringing it in contact with the eyes, nostrils, or lips.

EXTRACT OF LUPULIN.

By W. W. D. Livermore.

Lupulin procured by the usual method of sifting is necessarily more or less mixed with powdered hops, and of course varies in activity. The object in proposing an extract is to present a preparation containing the medicinal principles of hops unimpaired, of uniform strength, and in a form convenient for pills. The process of preparation is as follows:

℞		
	Lupulin (commercial)	℥iv.
	Alcohol	f℥viij.

Mix in a percolator and allow to stand an hour. Then displace with alcohol until two pints of filtered liquor are obtained. Pour this liquor into a shallow dish and set a side to evaporate spontaneously.

In making larger quantities of extract it saves expense to distil off three-fourths of the alcohol previous to exposing the tincture to evaporation.

Lupulin thus prepared possesses the active properties of hops in an eminent degree, and is in a convenient form for prescription—℥j. of commercial lupulin yields upon an average ℈ij. of the prepared article.

TINCTURA CINCHONÆ FERRATA.

By Alfred B. Taylor.

A preparation bearing this name has recently been introduced and prescribed to a considerable extent, which, from its name, promises more than from a critical examination of its properties it would seem to be entitled.

It was originally prepared at the suggestion of Dr. J. F. Meigs,

whose intention was to have a Tincture of Cinchona combined with iron, in such a form that it should not make a black, inky mixture. This object was proposed to be obtained by dissolving the ammonio-citrate of iron in the compound tincture of cinchona, previously deprived of its tannin by means of gelatin. Accordingly, a strong solution of gelatin was added to the ordinary Huxham's tincture, which had the effect of producing a copious precipitate, and as long as a precipitate appeared gelatin was added.

The tincture thus prepared, possessed the taste and smell of the original tincture, though considerably diluted, but was of a much lighter color, being very nearly the tint of sherry wine; on adding eight grains of the ammonio-citrate of iron to four ounces of this, there was still a precipitate made, showing either that gelatin would not remove all the tannin, or that the tincture contained some other precipitant of iron. This preparation was set aside as ineligible.

A tincture was then prepared by dissolving eight grains of the salt in four ounces of Huxham's tincture and filtering; this gave a handsome looking preparation, rather darker than Huxham's tincture, and was prescribed extensively.

Suspecting, from the amount of precipitate made by the addition of the iron, that a considerable part of the iron was separated, the following experiments were instituted: The precipitate made by dissolving 16 grs. of the ammonio-citrate of iron in 8 oz. of Huxham's tincture, was separated by filtration and ignited, so as to destroy the vegetable matter; it was then dissolved in chemically pure hydrochloric acid, to which a little nitric acid was added; the solution thus obtained was diluted and filtered, the filter being well washed with pure water. Ammonia was then added in excess, and the precipitate thus obtained being carefully washed and dried at a heat of 212°, (to which heat all the filters used in weighing were subjected before being counterpoised,) was found to weigh 3.8 grains.

16 grains of ammonio-citrate of iron were then ignited and treated as in the preceding experiment; the amount of sesquioxide of iron thus obtained was just six grains. From a comparison of these results it was found, that of the 16 grs. originally dissolved, there remained in the precipitate 10.13 grains.

An experiment was then tried with the clear tincture obtained

as above; two ounces, on being evaporated to dryness, ignited and treated as in the former examples, yielded .5 grain of sesquioxide of iron, indicating 1.33 grain of the citrate in the two ounces, or just two-thirds of a grain to each ounce.

Not being satisfied with this tincture, I was induced to examine the preparation as made by Mr. Samuel Simes of this city, which I understand has been extensively prescribed, and which purports to contain two grs. of citrate of iron to the ounce.

This preparation was similar in appearance to Huxham's tincture, and possessed a slight odor of brandy, as though partly made with that menstruum. The addition of solution of chloride of iron caused a deep black color, and solution of gelatine a copious flocculent precipitate, thus showing that the tincture had not been deprived of its tannin; on the addition of infusion of galls, a copious muddy precipitate was thrown down, which, after standing for some hours, became somewhat darker, but not nearly so dark as the color produced on adding infusion of galls to a solution of ammonio-citrate of iron, ¼ grain to the ounce. From this experiment it was suspected to be, like the former preparation, deficient in iron; accordingly, two ounces of the tincture was evaporated to dryness and treated precisely as the tincture in the preceding experiment. The amount of sesquioxide obtained was less than three-tenths of a grain, thus indicating that each ounce of the tincture contained less than half a grain either of the citrate or ammonio-citrate of iron, whichever salt may have been used.

The conclusion to be derived from these results is, that the tincture, as at present prepared, is very inefficient as regards the iron ingredient, (and if more iron be added the tincture becomes inky in its character,) and theoretically must be inferior to the ordinary Huxham's tincture, where the effect of cinchona is desirable.

The citrate of iron and quinine is a much more elegant and scientific preparation, possessing all the properties which this tincture might be expected to possess, besides the advantage that it may be given in pill, powder or solution.

PREPARATION OF MANNITE.

By Charles T. Bonsall.

The saccharine principle of manna being often in demand, it is quite troublesome to prepare it in the usual manner, by treating manna with boiling alcohol, and allowing the mannite to crystallize on cooling. It also becomes a dangerous operation in the absence of a well constructed water-bath, which, unfortunately, is too often wanting in many pharmaceutical shops, from the large amount of alcohol which must be employed, and the elevated temperature it is maintained at for some time, in order to be successful in extracting the mannite.

The plan I have pursued is the following: Dissolve manna in three times its weight of boiling water, and treat it with a small portion of solution of sub-acetate of lead, to separate gummy and resinoid matters; filter through muslin and precipitate the excess of lead by dilute sulphuric acid; filter through paper and concentrate with gentle heat to the consistence of syrup. Lastly, pour the syrup, while about the boiling temperature, into twice its bulk of cold alcohol, which will deposite the pure mannite, upon cooling, in snow white flakes. A very fat specimen of flake manna has yielded above 90 per cent.

PROCEEDINGS OF THE PHILADELPHIA COLLEGE OF PHARMACY, IN RELATION TO THE INSPECTION OF DRUGS.

A Special Meeting of the Philadelphia College of Pharmacy was held at their Hall, 3d mo., 30, 1853.

Charles Ellis, Vice President, in the chair.

In the absence of the Secretary, Edward Parrish was appointed Secretary pro tempore.

The call of the meeting being read, the object was stated to be to consider the subject of the Inspection of Drugs.

The subject was then more fully introduced by several of the members, who urged, that in view of the probable change in the office of Special Examiner at this port, it was due to the position of this College, and to the important interests involved, that we should be heard in our corporate capacity in regard to the qualifications of persons who should be appointed to fill such offices.

The difference in the practice of Examiners at the various Ports of Entry was adverted to as a cause of annoyance. The opinion was advanced that, unless in the hands of competent and disinterested officers, the law was productive of more evil than good results. It cannot be disguised, that, as at present administered at this port, it has given great dissatisfaction, occasioning useless delays and unnecessary loss to importers; and, in many instances, embarrassing the operations of trade without any corresponding advantage to the public.

The construction given to that passage of the law referring to the Pharmacopœias and Dispensatories as standards, was a subject of discussion, and it was believed advantage would result from a fuller explanation of its meaning and intent, as originally designed by its framers.

A draft of a memorial to the Secretary of the Treasury, in relation to the proper qualifications for the office of Special Examiner, was submitted by Prof. Procter, and, on motion, it, together with the whole subject of the meaning and intent of the law, as brought under discussion at this meeting, was referred to a committee of five, which was appointed by the chair, as follows: Wm. Procter, Jr., Dr. John Harris, Thos. H. Powers, H. C. Blair and E. Parrish.

On motion, It was further resolved, that this Committee be authorized to send two delegates, taken from the College at large, to deliver the memorial, as finally perfected by them, to the Honorable Secretary of the Treasury, and to represent to that officer the views of this College in regard to the intention of the law and its proper construction, and that the said memorial and the credentials of the said delegates be stamped with the seal of the College and signed by its proper officers.

On motion, it was also resolved, that said delegation to Washington be authorized to draw on the Treasurer of the College for the amount of their expenses in carrying out this direction.

Then adjourned.

EDWARD PARRISH, Secretary pro tem.

The Committee to whom the memorial, etc., was referred, met at the College Hall on Tuesday, the 31st of May, at 4 o'clock, P. M., and having carefully revised the memorial referred to them, and considered the sense of the Special Meeting as related to in-

structing the deputation to be sent to Washington, concluded their labors by the appointment of Daniel B. Smith, President of the College, and William Procter, Jr., Chairman of the Committee, to that service.

MEMORIAL.

"To the Hon. James Guthrie, Secretary of the Treasury of the United States, the Philadelphia College of Pharmacy respectfully represent:

That their Institution was established more than thirty years ago, through the public spirit of a number of the Apothecaries and Druggists of Philadelphia, and incorporated by the Legislature of Pennsylvania, with the design of improving the character of the drug and apothecary business, and for affording a better and more scientific education to the younger members of their profession; and now includes a large number of the best educated pharmaceutists of that city. This College, feeling themselves intrusted with a care for that part of the public weal involved in the preparation and dispensing of medicines, and consequently with the condition of the drug market, (upon the soundness of which the healthy condition of pharmacy much depends,) did, for many years previous to the enactment of the Drug Law, appoint annually a "Committee of Inspection," whose duty it was to keep a watch over the character of the drug market, and warn its members through their published Journal of the existence therein of spurious or deteriorated drugs. They have also interested themselves, from time to time, in special measures having the same object, and more especially, in connection with the other Colleges of Pharmacy, in regard to the *Act of Congress* requiring the inspection of imported drugs. Since the passage of that law, they have watched its influence on the quality of drug importations, and have been gratified with the improvement that has occurred in many particulars; yet they are forced to admit that inferior qualities of drugs do gain admittance into the country, and that serious and perplexing difficulties have occurred at several of the ports, owing to the variable construction of the law by the Examiners, by which honestly disposed importers have been inconvenienced and annoyed, and have suffered considerable losses from delay and the expenses incident to a reconsideration of the Examiner's decision.

Believing that the practical value of the law to the well disposed druggist and apothecary, and to the physician, and its usefulness through these to the community, depends in a great degree on the knowledge and faithfulness of the Examiners, we feel called upon respectfully, yet earnestly, to urge on your attention, in the exercise of the appointing power, the importance of a close scrutiny into the qualifications of these officers for the highly responsible duties assigned to them; and we feel assured that in pointing out

some of the requisites of a good officer, you will give us credit for an honest desire to aid in the successful execution of the *Enactment.*

As a large proportion of the drugs imported into the United States are of a description requiring an intimate acquaintance with their physical and sensible properties, rather than their chemical constitution, in properly subjecting them to inspection, it is indispensible that the Examiner should have had a *practical pharmaceutical education*, especially as many mixed medical compounds are in the list of imported articles, the merits of which cannot be judged by the abstract chemist. He should also be a practical chemist, so as to perform the chemical analyses and testing required in the execution of his duties himself, and not be necessarily dependent on others for knowledge and skill which he is employed to exercise, and which should be exercised in view of all the circumstances pertaining to the drugs examined. These, with the business habits requisite to insure the government from imposition in regard to the value and construction of invoices, and the integrity without which all other qualifications are ineffectual, should be found in the Special Examiner of Drugs.

In view of these circumstances, we would earnestly recommend, other requisites being equal, that well educated pharmaceutists, or, at least, individuals who have had a practical pharmaceutical education, should claim the preference among the candidates for the Examinership; trusting that your sense of the truth of the positions we have taken will induce you to act in accordance with them.

SEAL OF THE PHILADA. COLLEGE OF PHARMACY. 1821, FOUNDED. INCORPORATED 1822.

Signed

DANIEL B. SMITH, President.

CHARLES ELLIS, } V. Presidents.
SAMUEL F. TROTH, }

DILLWYN PARRISH, Secretary.

At a Special Meeting of the Philadelphia College of Pharmacy, held May 30th, 1853, with Charles Ellis, 1st Vice President, in the Chair, it was directed that the above memorial to the Secretary of the Treasury of the United States be engrossed, duly signed by the officers, and the seal of the College affixed, and that two members of the College be deputed to present it to the Hon. Secretary at Washington, with such verbal explanations as may be

necessary to convey to that officer a proper understanding of the document. Signed

EDWARD PARRISH, Sec. pro tem."

In accordance with their instructions, the deputation proceeded immediately to Washington, and obtained an interview with the Secretary of the Treasury. After stating the object of their visit, and presenting the Memorial of the College, they explained more fully the views entertained by that body in reference to the necessity of issuing new and more definite instructions to the Special Examiners, so as to avoid the irregularities that were liable to occur as at present; and also the importance of appointing men to the office of Examiners who are practically qualified by having had a pharmaceutical education. Mr. Guthrie replied, that he had become aware, since being in office, of the need of a revision of the instructions previously issued by the Department, and that Dr. Bailey, (the Examiner at New York), at his request, was engaged in preparing a paper for his consideration, which he believed would meet the views of the College, and which would be published in a few days. He further stated that, should the new instructions be inadequate to meet the just requirements of the Law, they could be modified.

CIRCULAR OF INSTRUCTIONS TO THE SPECIAL EXAMINERS OF DRUGS.

[The following copy of the Treasury Circular, is from the North American of June 14th.]

TO PREVENT THE IMPORTATION OF ADULTERATED DRUGS AND MEDICINES.

To Collectors and other Officers of the Customs, under the act of 26th June, 1848.

TREASURY DEPARTMENT, June 4, 1853.

It being represented to this Department, that much embarrassment has been experienced by officers of the customs, at some of the ports of the United States, in reference to the provisions of the act of 26th June, 1848, "to prevent the importation of adulterated and spurious drugs and medicines," it is deemed expedient, with a view to avoid future difficulties arising from misconstructions of the law, and to secure uniformity of practice at the several ports in carrying out its provisions with precision and efficiency, to furnish you with the additional instructions which follow, explanatory and in modification of the circular instructions addressed to you by the Department on the 8th July, 1848.

To avoid the recurrence of a difference of opinion between the

officers of the customs as to what particular articles of commerce should be considered drugs and medicines, and as such subject to special examination by the special examiner of drugs and medicines, it is thought proper to state that, in conformity with the evident spirit and intent of the law, it is required that all articles of merchandise used wholly or in part as medicine, and found described as such in the standard works specially referred to in the act, must be considered drugs and medicines, and that all invoices, therefore, of such articles, in whole or in part, must be submitted to the examination of the special examiner of drugs and medicines, before they can be permitted to pass the custom house.

In the examination on entry of any medicinal preparation, the said special examiner is to unite with the appraiser.

With a view to afford a reliable guide to the examiner of drugs and medicines, as well as to the analytical chemist, on appeal, in ascertaining the admissibility of such articles under the provisions of the law founded on their purity and strength, the following list is given of some of the principal articles, with the result of special tests agreeing with the standard authorities referred to in the law, all of which articles are to be entitled to entry when ascertained by analysis to be composed as noted, viz:

Aloes, when affording 80 per cent. of pure aloetic extractive.

Assafœtida, when affording 50 per cent. of its peculiar bitter resin, and 3 per cent. of volatile oil.

Cinchona Bark, when affording 1 per cent. of pure quinine, whether called Peruvian, Calisaya, Arica, Carthagena, Maracaibo, Santa Martha, Bogota, or under whatever name, or from whatever place; or

Cinchona Bark, when affording 2 per cent. of the several alkaloids combined, as quinine, cinchonine, quinidine, aricine, &c., the the barks of such strength being admissible as safe and proper for medicine and useful for chemical manufacturing purposes.

Benzoin, when affording 80 per cent. of resin, or
" " 12 " of benzoic acid.
Colocynth " 12 " of colocynthin.
Elaterium " 30 " of elaterin.
Galbanum, when affording 60 per cent. of resin:
" " 10 " of gum and
" " 6 " of volatile oil.
Gamboge, " 70 " of pure gamboge resin, and
" " 20 " of gum,
Guaiacum, " 80 " of pure guaiac resin.
Gum ammoniac " 70 " of resin, and
" " 18 " of gum.
Jalap, when affording 11 per cent. of pure jalap resin, whether in root or in powder.

Manna, when affording 37 per cent. of pure mannite.
Myrrh, " 30 " of pure myrrh resin, and
" " 50 " gum.
Opium, " 9 " of pure morphine.
Rhubarb, " 40 " of soluble matter, whether in root or powder; none admissible but the aticles known as East India, and Turkey, or Russian rhubarb.
Sagapenum, 50 per cent. of resin.
" 30 per cent. of gum, and
" 3 per cent. of volatile oil.
Scammony, 70 per cent. of pure scammony resin.
Senna, 28 per cent. of soluble matter.

All medicinal leaves, flowers, barks, roots, extracts,&c., not herein specified, must be, when imported, in perfect condition, and of as recent collection and preparation as practicable.

All pharmaceutical and chemical preparations, whether crystalised or otherwise, used in medicine, must be found on examination to be pure and of proper consistence and strength, as well as of perfect manufacture, conformably with the formulas contained in the standard authorities named in the act; and must in no instance contain over three per cent. of excess of moisture or water of crystallization.

Essential or volatile oils, as well as expressed oils used in medicine, must be pure, and conform to the standards of specific gravity noted and declared in the dispensatories mentioned in the act.

"Patent or secret medicines" are by law subject to the same examination, and disposition after examination, as other medical preparations, and cannot be permitted to pass the Custom House for consumption, but must be rejected and condemned, unless the special examiner be satisfied, after due investigation, that they are fit and safe to be used for medicinal purposes.

The appeal from the report of the special examiner of drugs and medicines, provided for in the act, must be made by the owner or consignee within ten days after the said report; and in case of such appeal, the analysis made by the analytical chemist is expected to be full and in detail, setting forth clearly and accurately, the name, quantity, and quality of the several component parts of the article in question; to be reported to the collector under oath or affirmation.

On such report being made a copy of the same will be immediately furnished by the collector to the special examiner of drugs and medicines, who, if the report be in conflict with his return made to the collector, and he have cause to believe that the appeal and analytical examination have not been conducted in strict conformity with the law, may enter his protest in writing against the reception and adoption by the collector of such report and analysis, until a

reasonable time be allowed him for the preparation of his views in the case, and their submission to this department for its consideration.

JAMES GUTHRIE,
Secretary of the Treasury.

ON THE SALE OF POISONS IN NEW HAMPSHIRE.

Concord, N. H., June 7th, 1853.

To the Editor:

Dear Sir,—I observed in the March number of the excellent "Journal of Pharmacy," edited by yourself, a call for information concerning the sale of poisons in the various States. Not knowing whether or not you have any members of your Association in this State who would respond to your call, I have taken some pains to collect the following facts, and think they can be relied on as accurate. Of course, if any one answers your inquiries more fully or more acceptably, you are at entire liberty to throw this aside.

Numbering my answers to correspond to your enquiries, I reply, 1st, a State law exists, which is as follows:

"*Sec*. 1. Every apothecary, druggist, or other person, who shall sell any arsenic, corrosive sublimate, nux vomica, strychnia or prussic acid, shall make a record of such sale in a book kept for that purpose, specifying the kind and quantity of the articles sold, and the time when, and the name of the person to whom such sale is made, which record shall be open to all persons who may wish to examine the same.

"*Sec*. 2. The foregoing section shall not apply to physicians in their prescriptions or receipts to their patients.

"*Sec*. 3. Any person who shall violate the provisions of this chapter shall forfeit the sum of one hundred dollars, to be recovered by indictment in any court of competent jurisdiction, one half to the use of the county, and the other half to the use of the prosecutor."—*N. H. Compiled Statutes, Chap*. 228.

2d. This law was passed in 1848, and amended in 1850 by the addition of nux vomica and strychnia to the list of poisons. In its operation it is almost, if not entirely, ineffectual. After making diligent enquiry of the druggists in this and other large towns in the State, I feel authorized to say that not more than one in five of the druggists pretend to keep such a record as the law requires, and those that are kept are very imperfect. I have found that

some of our druggists were not even aware of the existence of the law. The law does no injury, but it cannot be said to do any great amount of good.

3d. All the conservative action among druggists themselves is what arises from their own sense of what is right and proper. There is no understanding among them as to such sales that I can hear of.

4th. Grocers and shopkeepers rarely, if ever, retail arsenic or any other of the poisons specified in this law. In some of the small towns the storekeeper sometimes keeps a little paregoric with some of the drugs in common use, such as rhubarb, but it is not usually the case. Perhaps more oxalic acid is sold than any other dangerous poison, but this is chiefly used by the shoemakers and other manufacturers who are aware of its power. No instances of poisoning by it have for several years come to my knowledge in this State.

I am yours respectfully,

EDWARD H. PARKER.

SALE OF POISONS IN INDIANA.

Richmond, 5th mo. 3d, 1853.

To the Editor of the American Journal of Pharmacy:

Esteemed Friend,—On the perusal of the last number of the Journal, I am reminded, by the publication of S. P. Peck's letter therein, of the request to furnish information relative to the sale of poisons in the various States. In complying on behalf of this section I can briefly say, that, in Indiana, neither the recently revised statutes nor the older ones, so far as I have any knowledge of them, make any provision for the sale of poisons.

In this place, (Richmond,) with a population of 3000 to 4000 persons, there are four professed druggists; but one of whom refuses to sell patent medicines; and that one alone keeps a record of the sales of poisons, naming the purchaser, the quantity he obtains, the stated use of the poison, the date of the purchase, and marking the outer wrapper *Poison*.

I believe the sale of arsenic, &c. is wholly confined to the drug stores in town; and whether it is kept by other dealers in the smaller towns in the State, I am unable to say at present.

Pounds of arsenic are sold at the foregoing stores annually, (and it is by far the principal poison purchased,) and professedly for the destruction of rats. Half an ounce and an ounce are the quantities generally bought. A few parcels of corrosive sublimate, (a drachm or so at a time,) are sold in the course of the year for veterinary purposes. No accident is known to have occurred from all these sales; and but one criminal application of poison during the last two or three years. Hence, a preparation (which I have had on hand for this period) for the ready formation of the hydrated peroxide of iron, remains as I first made it, unemployed.

Thy friend,

JOHN T. PLUMMER, [M. D.]

REMARKS ON BOGOTA AND OTHER CINCHONA BARKS FROM NEW GRENADA, IN THEIR RELATION TO THE MANUFACTURE OF SULPHATE OF QUINIA.

By WILLIAM PROCTER, JR.

It is generally known that the Cinchonas valuable in medicine are found on the eastern slopes of the Bolivian, Peruvian, and New Grenadan Andes, at a considerable elevation, and that at least sixteen varieties have been found. It is also equally well known that the Bolivian bark called calisaya contains the largest percentage of quinia and commands the highest price, and that the medicinal value of the other varieties is rated in proportion to the quinia and cinchonia they contain. Chemists have shown that a close relation exists between the several alkaloids that have been obtained from the cinchonas, they being theoretically oxides of a common radical, yet varying in the proportions yielded by different species, and by the same species in different localities. The cause of this variation is an interesting question to the vegetable physiologist. Soil, elevation, the shade of associated trees, and probably other causes are concerned in the elaboration of these valuable constituents, and in determining their relative and absolute proportions.

Of the immense quantities of Bolivian barks exported from South America, more than nine-tenths are manufactured into sulphate of quinia. Knowing its superiority for this purpose, and aware of the indispensable necessity of sulphate of quinia to the

civilized world, and believing that their own mountain slopes contained all the bark available for this manufacture, the Bolivian Government established their famous monopoly, by which the supply was shortened and the price elevated until it arose from 45 cents to $1.75 per pound. Seeing no end to this interference, the merchants and chemists of Europe have industriously sought new sources of supply, and during the last few years the mountains of New Grenada in the regions of Popayan and Bogota, have furnished barks which far exceed in quinia value the Carthagena barks described in the books. The introduction of these barks brought down the price of the monopoly bark to $1.05, which has again risen in consequence of the large demand for material by the manufacturers of the United States, who have been precluded from using the barks of New Grenada by the construction put upon the Drug Law by some of the Examiners.

Of the immense exportation of calisaya bark from Bolivia the manufacturers of this country have consumed of late years as much as all the rest of the world together; hence the importance to them of participation in the use of the Bogota, Pitaya, and other Grenadan barks which, within the past two or three years, have been exported to Europe to the extent of from 12,000 to 15,000 ceroons, and several varieties of which are sought after with an avidity that proves how highly they are esteemed by manufacturers of quinine.

That this demand is based on correct data there can be no doubt. Chemistry has advanced too far, and qualified analytical chemists are too numerous, for manufacturers of good character to risk their reputation merely to deceive the medical public for their own pecuniary interest. Without depending on foreign statements, it may be well to give a few results obtained in this city from barks from the regions alluded to. 1000 grains of each bark was treated.

These analyses being made solely to ascertain the quinia value of the barks, no attempt was made to determine the exact nature of the associated basic matter, which was believed to be either quinidin or cinchonin, or perhaps both. Other specimens of these barks have yielded but 4 grs., and even but 2 or 3 grs. of quinia per 1000 grs. of bark, but these would not be worked by the manufacturer.

1st. Bogota (Fusagasuga) Bark:

Cinchonia, or quinidin, or both,	10 grs.
Sulphate of quinia	9 "
Extractive residue	8 "

2d. Cinchonia, &c. 8 "
Sulphate of quinia 19 "
Extract 6 "

3d. A fibrous yellow bark from Bogota:

Cinchonia, &c.	8 "
Sulph. quinia	17 "
Extractive	16 "

4th. Another specimen:

Cinchonia, &c.	12 "
Sulph. quinia	13 "
Extract	10 "

5th. Another specimen:

Cinchonia, &c.	5.6 grs.
Sulph. quinia	16 "
Extract	16 "

6th. Pitaya bark, marked Duque, (from near Popayan):

Sulphate of quinia	25 grs.
Extractive	12 "

7th. Another specimen, marked San Antonio:

Cinchonia, &c.	16 "
Sulphate of quinia	18 "

8th. Another specimen:

Cinchonia, &c.	20 "
Sulphate of quinia	15 "

9th. Another specimen:

Cinchonia, &c.	26 "
Sulphate of quinia	17 "
Extract	30 "

Now, barks that will yield these quantities of sulphate of quinia, owing to their much lower prices, are profitably worked by the manufacturer to the rejection of every ingredient except the quinia, and there can be no good reason advanced why they should not be employed. As well might exception be taken to dolomite as a source of magnesia and its preparations, because it contains lime, deeming that magnesite only should be used. What is it to the physician or the apothecary whether the sulphate of copper he uses is made from the richest ore of Lake Superior, or old copper sheathing, if it is pure? Why, at this very moment a prize of four thousand francs, offered to the man who shall discover an *artificial* method of making quinia, or in failure of that, find a natural product that shall equal quinia as an antiperiodic, remains unclaimed in the hands of the treasurer of the Society of Pharmacy of Paris, and which was offered several years ago, in view of the supposed approaching failure of the natural source of this important medicine. Yet in view of all this, an officer of the United States, whose duty is to prevent the importation of *adulterated* drugs, medicines and medicinal preparations, refuses entry to an invoice of Bogota bark because it is "*one of the varieties of Carthagena bark, all of which are specified by the United States Pharmacopœia and Dispensatory*

as unofficinal!! Now what are the facts of the case? The U. S. Pharmacopœia says not one word about Carthagena bark, any more than it does about the barks in question, which have been thrown into commerce since the Pharmacopœia was published. The U. S. Dispensatory says, "Carthagena barks are not recognized by the Pharmacopœias." And why? Because, for the purposes required by these authorities, the three varieties of bark therein specified are deemed the best; yet by Pharmacopœia authority, under the name of "Cinchona Pallida," Loxa barks, so called, and analogous varieties, have admittance *ad libitum*, which contain but a trace of quinia, with from one to three per cent of cinchonia. I have examined a bark from the west coast without a trace of quinia and over three per cent. of cinchonia; yet under the construction lately put upon the law by the inspector at this port, of *officinal* and non-officinal, all such barks may enter.

But the new instructions [see page 302] issued by the present Secretary of the Treasury, dated June 4th, inst., have the following clauses:

"Cinchona bark, when affording *one* per cent. of pure quinia, whether called Peruvian, Calisaya, Arica, Carthagena, Maracaibo, Santa Martha, Bogota, or under whatever name, or from whatever place; or

"Cinchona bark, when affording *two* per cent. of the several alkaloids combined, as quinia, cinchonia, quinidin, aricine, &c., the barks of such strength being admissible as safe and proper for medicine, and useful for chemical manufacturing purposes."

These clauses establish a standard by which the Examiner can easily test all the cinchona barks, and will, if acted on, prevent the introduction of the inferior pale barks, and furnish the manufacturers of sulphate of quinia with the material they demand to enable them to compete with European manufacturers. The last clause is evidently intended to refer to the pale barks, which are *known* to contain less than one per cent. of quinia. Yet, if we are correctly informed, the Examiner of this port construes it to mean that one per cent. of quinia shall be found in the gross amount of alkaloids,—a forced construction, which will compel him to reject the entire range of pale barks, notwithstanding they are protected by his favorite word "officinal."

We are informed that the real grounds of the opposition of the Examiner to the introduction of Bogota bark is, that it contains only quinidine or some alkaloid different from quinine; and this is insisted on despite the results of analysis abroad and at home. If this is his conscientious opinion, why not openly say so in his rejection, that his opinion may be verified or disproved by an appeal to analysis, and not stand behind a technical word unknown in the law and misinterpreted by himself? If Bogota barks did not contain quinine, and were imported solely for manufacturing quinidin for adulterating quinia, the Examiner would have found support instead of opposition in this article.

We cannot let this subject pass without alluding to a recent case, in which a lot of English sulphate of quinine was condemned and rejected, apparently, because it was believed to have been made from Bogota bark. The following is a copy of the letter of rejection from the Deputy Collector to the importer:

"*Custom House, Philada.*
Collector's Office, May 20th, 1853.

J. K. SULGER, ESQ.

SIR,—You are hereby notified that the case of Howards and Kent's Sulphate of Quinine, marked J. K. S. No. 1, imported by you per steamer City of Glasgow, on the 7th inst., has been rejected by the Special Examiner of drugs, as not being the officinal sulphate of quinine as furnished by the officinal yellow bark, viz., cinchona calisaya, and therefore specified by law as improper to be used for medicinal purposes.

Yours, &c.,
C. M. PREVOST, Dep. Collector."

There is something about this document that would be amusing, did it not involve so much trouble, delay and loss to the importer. The Examiner in this act, at least, shows his consistency; yet, in doing so, has brought to light a new feature of the law, wherein it appears that sulphate of quinine is specified to be improper for medicinal use, unless made from calisaya bark!! What is "officinal sulphate of quinine," but pure sulphate of quinine? Why is calisaya bark directed, but because it is the best for that purpose of the varieties recognized by the Pharmacopœia? For what purpose are the tests given at page 208 of that work, but as a *standard* to judge of the purity of the salt?

the very touch-stone really specified by law by which it should be judged. The U. S. Pharmacopœia directs oxychloride of antimony in the preparation of tartar emetic; as well might the Examiner reject foreign tartar emetic because it is made of the subsulphate or oxysulphuret.

At the request of Mr. C. H. Dingee, who sent me the foregoing copy of the Deputy Collector's letter, with a bottle of the rejected sulphate of quinine, an examination was made with the following results:

"1st. Ten grains of the suspected sulphate was not wholly dissolved at the temperature of 212° (Fahr.) by 250 grains of water, but formed a transparent solution with less than 320 grains. After the solution had stood 24 hours, the salt, which separated in crystals, when carefully collected and air dried, weighed 9.1 grains. The liquid from which the salt separated when evaporated to dryness, yielded .81 gr. of crystals, which re-acted with tests like the original salt.

"2d. Ten grains of the suspected sulphate was put into a test tube with 23 drops of water, two drops of sulphuric acid, and shaken until dissolved, after which 90 drops of ether and 30 drops of spirit of ammonia were added and shaken together. In a few moments the mixture separated into two transparent liquids without any solid or undissolved matter intervening; nor had any crystallization or other change occurred in the ethereal solution at the end of 36 hours.

"3d. Ten grains of the suspected sulphate dissolved in water by means of two drops of sulphuric acid, yielded a bulky white, uncrystalline precipitate on adding a slight excess of ammonia; by heating the tube the precipitate coalesced into a mass which, after being washed and dried, weighed 7·4 grains. A part of this dissolved in absolute alcohol, remained as a resin-like residue on evaporation without the formation of crystals.

"4th. (Kent's test.) Five grains of the suspected salt was dissolved in half a drachm of acetic acid, four drops of tincture of iodine added, and heat applied until the liquid became reddish brown and transparent. On cooling, the solution deposited numerous green, cantharides-lustred crystals of the iodo-sulphate of quinia of Dr. Herapath. (See page 317.)

"Finally, the suspected sulphate of quinine reacts with chlorine water and ammonia, and with chlorine water, prussiate of

potash and ammonia, as the pure salt, and in its form of crystallization agrees with the same."

From these results the opinion was given that the salt was free from impurity and of good quality and appearance. The sulphate was enclosed in a tall cylindrical "quinine bottle" with a red wax seal, with the words "quiniæ sulphas" on it, and with a white label inscribed with "Sulphate of Quinine; Prepared by Howards and Kent, Stratford, London."

It has been stated that the Examiner considers the base of the "sulphate of quinine" in question as an alkaloid differing from quinia and quinidine;—perhaps B. quinine. It is to be hoped, for the sake of science, that he will describe its properties and draw the lines of distinction between it and quinia.

ACT FOR REGULATING THE QUALIFICATIONS OF PHARMACEUTICAL CHEMISTS IN ENGLAND AND SCOTLAND.

Whereas, it is expedient for the safety of the public that persons, exercising the business or calling of Pharmaceutical Chemists in Great Britain, should possess a competent practical knowledge of Pharmaceutical and general Chemistry and other branches of useful knowledge: And whereas, certain persons, desirous of advancing Chemistry and Pharmacy, and of promoting an uniform system of educating those who should practice the same, formed themselves into a Society, called "The Pharmaceutical Society of Great Britain," which said Society was on the 18th day of February, 1843, incorporated by royal charter, whereby it was provided that the said Society should consist of Members who should be Chemists and Druggists, who were or had been established on their own account at the date of the said charter, or who should have been examined in such manner as the Council of the said Society should deem proper, or who should have been certified to be duly qualified for admission, or who should be persons elected as superintendents by the Council of the said Society: And whereas, it is expedient to prevent ignorant and incompetent persons from assuming the title of or pretending to be Pharmaceutical Chemists or Pharmaceutists in Great Britain, or Members of the said Pharmaceutical Society, and to that end it is desirable that all persons, before assuming such title, should be duly examined as to their skill and

knowledge by competent persons, and that a register should be kept by some legally authorized officer of all such persons: And whereas, for the purpose aforesaid, and for extending the benefits which have already resulted from the said Charter of Incorporation, it is desirable that additional powers should be granted for regulating the qualifications of persons who may carry on the the business of Pharmaceutical Chemists: be it enacted, by the Queen's most excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same;

I. That the said Charter of Incorporation, granted to the said Society on the 18th day of February, 1843, save and except such part or parts thereof as are hereby altered, varied, or repealed, shall be and the same is hereby confirmed and declared to be in full force and virtue, and shall be as good and effectual to all intents and purposes as if this Act had not been passed.

II. The Council of the said Pharmaceutical Society shall be and the same are hereby authorized and empowered to alter and amend the by-laws of the said Society, made and established under or in pursuance of the said Charter of Incorporation, and to make and establish such new or additional by-laws as they shall deem proper and necessary for the purposes contemplated by the said charter or by this Act; provided always, that all such original by-laws, and all altered, amended, or additional by-laws, shall be confirmed and approved by a Special General Meeting of the members of the said Pharmaceutical Society, and by one of her Majesty's principal Secretaries of State; provided also, that the existing by-laws of the said Society shall continue in force until the next Annual Meeting of the said Society, to be held in the month of May, 1853.

III. At all meetings of the said Society, at which votes shall be given for the election of officers, all members entitled to vote may give their votes either personally, or, in cases of residence exceeding five miles from the General Post Office, St. Martin's-le-Grand, London, by voting papers authorized by writing, in a form to be defined in the by-laws of the said Society, or in a form to the like effect, such voting papers being transmitted under cover to the secretary not less than five clear days prior to the day on which the election is to take place.

IV. The Council of the said Pharmaceutical Society shall, within three calendar months after the passing of this Act, appoint a fit and proper person as a Registrar under this Act, and the Council of the said Society shall have the power to remove the said registrar, or any future registrar to be appointed under this Act, from the said office, and from time to time to appoint a new registrar in the room of any registrar who may die, or retire, or be removed from office as aforesaid, and also to appoint and remove from time to time a deputy registrar, and such clerks and other subordinate officers as may be requisite for carrying out the purposes of this Act, and also to pay suitable salaries to the said registrar, deputy registrar, clerks, and officers.

V. The Registrar to be appointed under, or by virtue of this Act, shall from time to time make out and maintain a complete register of all persons being Members of the said Society, and also of all persons being Associates and Apprentices or Students respectively, according to the terms of the Charter of Incorporation, and shall keep a proper index of the register, and all such other registers and books as may be required by the Council of the said Society, and may be necessary for giving effect to the by-laws of the said Society, and to the provisions of this Act.

VI. All such persons as shall at the time of the passing of this Act be Members, Associates, Apprentices, or Students of the said Pharmaceutical Society of Great Britain, according to the terms of the said Charter of Incorporation, shall be registered as Pharmaceutical Chemists, Assistants, and Apprentices or Students respectively.

VII. The Registrar to be appointed under or by virtue of this Act shall be bound, on the application of any person paying one shilling, to certify under his hand whether or no any person whose name and address shall be furnished to him appears in the said register, or is a Member of the Pharmaceutical Society of Great Britain or not; and the certificate of such registrar, signed by the said registrar, and countersigned by the President or two Members of the Council of the said Society, shall, in the absence of evidence to the contrary, be sufficient evidence of the facts therein stated up to the date of the said certificate.

VIII. All such persons as shall from time to time be appointed under or in pursuance of the said Charter of Incorporation or the

by-laws thereof, or under this Act, shall be and the same are hereby declared to be fit and proper persons to conduct all such examinations as are provided for or contemplated by this Act, and shall respectively have full power and authority and are hereby authorized and empowered to examine all persons who shall present themselves for examination under the provisions of this Act in their knowledge of the Latin language, in Botany, in Materia Medica, and in Pharmaceutical and general Chemistry, and such other subjects as may from time to time be determined by any by-law; provided always that such examinations shall not include the Theory and Practice of Medicine, Surgery, or Midwifery; and the said examiners are hereby empowered to grant or refuse to such persons, as in their discretion may seem fit, certificates of competent skill and knowledge and qualification to exercise the business or calling of Pharmaceutical Chemists, or, as the case may require, to be engaged or employed as Students, Apprentices, or Assistants respectively.

IX. And to enable the said Society to provide for the examination in Scotland of such Students, Apprentices, or Assistants in Scotland as may desire to be examined there, it shall be lawful for the Council of the Society, and they are hereby required, to appoint such fit and proper persons in Scotland, to meet in Edinburgh or Glasgow, or such other place or places as the Council may think desirable, and to conduct there all such examinations as are provided for and contemplated by this Act, with such and the like powers and authorities in respect thereof as are herein conferred, and to grant to the persons to be so examined such and the like certificates as are hereinbefore specified and referred to, or to refuse the same; and all the provisions of this Act shall be equally applicable to the examiners, examinations, and parties examined in Scotland, as to the examiners, examinations and parties examined in England.

X. Every such person who shall have been examined by the persons appointed as aforesaid, and shall have obtained a certificate of qualification from them, shall be entitled to be registered by the registrar according to the provisions of this Act, upon the payment of such fee or fees as shall be fixed by the by-laws; and every such person duly registered as a Pharmaceutical Chemist shall be eligible to be elected as a Member of the said Society;

and every such person duly registered as an Assistant shall be eligible for admission as an Associate of the said Society; and every such person duly registered as a Student or Apprentice to a Pharmaceutical Chemist shall be eligible for admission into the said Society, according to the by-laws thereof.

XI. That no person who is a member of the medical profession, or who is practising under right of a degree of any university, or under a diploma or license of a medical or surgical corporate body, shall be entitled to be registered under this Act; and if any registered Pharmaceutical Chemist shall obtain such diploma or license, his name shall not be retained on the said register during the time that he is engaged in practice as aforesaid.

XII. From and after the passing of this Act, it shall not be lawful for any person, not being duly registered as a Pharmaceutical Chemist according to the provisions of this Act, to assume or use the title of Pharmaceutical Chemist or Pharmaceutist in any part of Great Britain, or to assume, use, or exhibit any name, title, or sign implying that he is registered under this Act, or that he is a member of the said Society; and if any person, not being duly registered under this Act, shall assume or use the title of Pharmaceutical Chemist, or Pharmaceutist, or shall use, assume, or exhibit any name, title, or sign implying that he is a person registered under this Act, or that he is a Member of the said Society, every such person shall be liable to a penalty of five pounds; and such penalty may be recovered by the registrar to be appointed under this Act, in the name and by the authority of the Council of the said Society, in manner following (that is to say,)

In England or Wales, by plaint under the provisions of any Act in force for the more easy recovery of small debts and demands:

In Scotland, by action before the Court of Sessions in ordinary form, or by summary action before the sheriff of the county, or in the royal burghs before the magistrates of the burghs where the offence may be committed or the offender resides, who, upon proof of the offence or offences, either by confession of the party offending, or by the oath or affirmation of one or more credible witnesses, shall convict the offender, and find him liable in the penalty or penalties aforesaid, as also in expenses; and it shall be lawful for the sheriff or magistrate, in pronouncing such judgment for the penalty or penalties and costs, to insert in such judgment a warrant,

in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding:

Provided always, that it shall be lawful for the sheriff or magistrate, in the event of his dismissing the action and assoilzieing the defender, to find the complainer liable in expenses; and any judgment so to be pronounced by the sheriff or magistrate in such summary application shall be final and conclusive, and not subject to review, by advocation, suspension, reduction, or otherwise.

XIII. Provided always, that no action or other proceeding for any offence under this Act shall be brought after the expiration of six months from the commission of such offence; and in every such action or proceeding, the party who shall prevail shall recover his full cost of suit or of such other proceedings.

XIV. All and every sums and sum of money which shall arise from any conviction and recovery of penalties for offences incurred under this Act, shall be paid as the Commissioners of her Majesty's Treasury shall direct.

XV. If any registrar under this Act shall wilfully make or cause to be made any falsification in any matters relating to any register or certificate aforesaid, every such offender shall be deemed guilty of a misdemeanor.

XVI. If any person shall wilfully procure by any false or fraudulent means a certificate purporting to be a certificate of registration under this Act, or shall fraudulently exhibit a certificate purporting to be a certificate of membership of the Pharmaceutical Society, every such person so offending shall be judged guilty of a misdemeanor.

[We had intended to accompany the publication of the above Act with an account of the steps taken to obtain it, and the proceedings of the Pharmaceutical Society for carrying it into effect; but time has not rendered it admissible. We hope in a future number to do so from the abundant material in our hands.—Editor Amer. Journ. Pharm.]

ON QUINIDINE.

By Edward N. Kent.

It has been recently asserted by M. Henry that quinidine is merely a hydrate of quinine, or quinine plus 2 atoms of water. This statement has been considered erroneous by other chemists,

but no facts have been elicited which prove it to be so. From my own experiments on this subject, I am induced to believe that the two alkaloids are entirely dissimilar in their chemical composition.

Sulphate of quinine, dissolved in an aqueous solution of chlorine, and a few drops of ammonia added, furnishes a deep green color characteristic of quinine. Sulphate of quinidine treated in the same manner, remains colorless if free from quinine.

Sulphate of quinine, dissolved in acetic acid, a few drops of tincture of iodine added, the mixture heated and allowed to cool, furnishes a beautiful emerald green crystalline compound, called sulphate of iodo-quinine by Dr. Herepath, its discoverer. Sulphate of quinidine, treated in the same manner, furnishes a *brown* precipitate.

The sulphate of quinine used for the above experiments was prepared by re-crystallizing the commercial salt. The sulphate of quinidine was prepared from a sample of pure quinidine, received from C. Zimmer, Frankfort-on-the-Maine. The first being a di-sulphate, and the second a neutral salt. The reaction with chlorine and ammonia being entirely independent of the acid or water of hydration, this test alone is sufficient to prove that quinidine is not a hydrate of quinine.—*N. Y. Jour. of Pharmacy, May*, 1853.

ON THE PRACTICAL APPLICATION OF TUNGSTEN, MOLYBDENUM, TITANIUM, AND SILICUM, TO ELECTRO-PLATING.

By M. Junot.

Tungsten.—M. Junot first prepared his tungsten baths with tungstate of ammonia dissolved in a lye of carbonate of soda, with the addition of 200 parts of cyanide of potassium for each 1,000 parts of metallic salt, sufficient water being added to bring the solution to specific gravity 1,050 to 1,055. He obtained equally good results by the employment of sulphites and hypo-sulphites of soda or ammonia. Lastly, however, he has obtained very superior results by the employment of the double cyanides of tungsten and sodium, prepared simultaneously in the following manner: A hot saturated solution of oxide of tungsten in carbonate of soda

lye of specific gravity 1,200, is made and filtered, whilst hot, through an excess of oxide of tungsten. The solution, when cold, is then placed in a Woulfe's apparatus, and saturated with hydrocyanic gas; when the solution has acquired a dark brown color, the operation is finished. The Woulfe's apparatus is then allowed to cool, after which, the double cyanide thus obtained is poured into a lye of carbonate of soda, of specific gravity 1,043, in which 75 parts of cyanide of potassium has previously been dissolved in each 1,000 parts of the concentrated solution of the double cyanide. The whole is then boiled for one hour, and twice carefully filtered. In this condition the bath contains about 15 parts of metal in each 1,000 parts of the solution.

Molybdenum.—M. Junot has obtained some very excellent deposits of molybdenum in solutions of phosphate, tartrate and sulphite of soda, also in cyanide of potassium, by employing the red oxide of molybdenum, precipitated by yellow prussiate of potash; but he finds the same kind of bath as that used for tungsten to answer quite as well.

Titanium.—M. Junot effects a deposition of titanium by dissolving titanate of potash in boiling sulphuric acid, evaporating the solution to a pasty consistence, and dissolving the mass in a solution of sulphate of soda of specific gravity 1,051 to 1,059. The titanium thus obtained is white, very brilliant, having a slight golden cast when viewed in a certain position.

Silicium.—After having drained in a filter the silicious jelly obtained by precipitation from a solution of soluble glass by means of hydrochloric acid, a concentrated solution is made of it in carbonate of soda lye of specific gravity 1,200. The boiling is continued for some time, until there remains an excess of silica, which will not dissolve; the solution is then filtered whilst hot, and allowed to stand for two days. The clear solution is then drawn off from the crystals of soda which are formed at the bottom of the vessel, diluted with five times its volume of distilled water, in which 25 parts of cyanide of potassium for every 1000 have previously been dissolved; the whole is then well boiled and carefully filtered. After several days' rest, this bath works perfectly if a current of electricity be passed through it for one day. The deposit of silicum obtained by the use of this bath is of a buff color, slightly rainbow tinted, and its resisting power is so great

that a spoon which had been immersed in it for but four hours, stood the melting in it of litharge over a charcoal fire; and when the reduced metal was run out, not the slightest spot was perceptible, although the spoon was made of inferior brass.

Tungsten, molybdenum and silicum, alloyed with one another, or separately alloyed with silver, in the proportion of 5 to 100 of silver, give excellent results, communicating to that metal many of their own peculiar properties.—*Annals of Pharmacy, June*, 1853.

ON THE PREPARATION OF CRUDE PELARGONATE OF ETHYL-OXIDE (ESSENCE OF QUINCE.)

By Dr. R. Wagner.

It has been believed, until the most recent period, that the peel of quinces contains œnanthylate of ethyl-oxide. New researches, however, have led to the supposition that the odorous principle of quinces is derived from the ether of pelargonic acid. In my last research on the action of nitric acid on oil of rue, I found that besides the fatty acids, which Gerhardt had already discovered, pelargonic acid is formed. This process may be advantageously employed for the preparation of crude pelargonate of ethyl-oxide, which, on account of its extremely agreeable odor, may be applied as a fruit essence equally with those prepared by Dobereiner, Hofmann and Fehling. For the preparation of the liquid, which can be named the essence of quince, oil of rue is treated with double its quantity of very diluted nitric acid, and the mixture heated until it begins to boil. After some time two layers are to be observed in the liquid; the upper one is brownish, and the lower one consists of the products of the oxidation of oil of rue and the excess of nitric acid. The lower layer is freed from the greater part of its nitric acid by evaporation in a chloride of zinc bath. The white flocks frequently found in the acid liquid, which are probably fatty acids, are separated by filtration. The filtrate is mixed with spirit, and long digested in a gentle heat, by which a fluid is formed, which has the agreeable odor of quince in the highest degree, and may be purified by distillation. The spirituous solution of pelargonic ether may also be profitably prepared from oleic acid, according to Gottlieb's method.—*Journal fur Praktische Chemie, and Annals of Pharmacy, April*, 1853.

USE OF COFFEE-LEAVES IN SUMATRA.

From the *Overland Singapore Free Press*, published Jan. 3, 1853, we extract the following letter signed "*An old Sumatran*," upon the use of coffee-leaves for the preparation of a beverage in the island of Sumatra. We briefly alluded in the *Pharmaceutical Journal* for June, 1852 (Vol. xi., p. 578,) to a project for employing coffee-leaves in this country as a substitute for tea.

"In the *Singapore Free Press*, of the 17th September last, are extracts from the *Colombo Observer*, by which it appears a patent has been taken out by Dr. Gardner (known to us by his travels in South America*) for preparing the coffee-leaf in a manner to afford a beverage like tea, that is, by infusion, 'forming an agreeable, refreshing, and nutritive article of diet.'

"It may be interesting to Dr. Gardner, his friends, and the public in general to learn, that an infusion of the coffee-leaf is an article of universal consumption amongst the natives of this part of Sumatra; wherever coffee is grown the leaf has become one of the very few necessaries of life which the natives regard as indispensable.

"The coffee plant in a congenial soil and climate exhibits great luxuriance in its foliage, throwing out abundance of suckers and lateral stems, especially when from any cause the main stem is thrown out of the perpendicular, to which it is very liable from its great superincumbent weight compared with the hold of its roots in the ground. The native planters, availing themselves of this propensity, often give the plant a considerable inclination, not only to increase the foliage, but to obtain new fruit-bearing stems when the old ones become unproductive. It is also found desirable to limit the height of the plant by lopping off the top, to increase the produce and facilitate collecting it, and fresh sprouts in abundance are the certain consequence. These are so many causes of the development of a vegetation which becomes injurious to the quantity of the fruit or berry unless removed; and where this super-

*It is Dr. John Gardner of London who exhibited prepared coffee-leaves at the Great Exhibition of 1851. Mr. George Gardner, late superintendent of the Botanical Garden at Peradenia, Ceylon, and author of *Travels in the Interior of Brazil*, died in Ceylon in March, 1849.—Ed. *Pharm. Journ.*

abundant foliage can be converted into an article of consumption, as hitherto the case in Sumatra, the culture must become the more profitable, and it is clearly the interest of the planters of Ceylon to respond to the call of Dr. Gardner, and by supplying the leaf on reasonable terms, to assist in creating a demand for an article they have in abundance, and which for the want of that demand is of no value to them. It ought to be mentioned also, that the leaves which become ripe and yellow on the tree and fall off in the course of nature, contain the largest portion of extract and make the richest infusion, and I have no doubt, should the coffee-leaf ever come into general use, the ripe leaf will be collected with as much care as the ripe fruit.

"The mode of preparation by the natives is thus:—The ends of the branches and suckers with the leaves on, are taken from the tree and broken into lengths of from twelve to eighteen inches. These are arranged in the split of a stick or small bamboo, side by side, forming a truss in such a manner, that the leaves all appear on one side and the stalks on the other, the object of which is to secure equal roasting, the stalks being thus exposed to the fire together and the leaves together. The slit being tied up in two or three places, and a part of the stick or bamboo left as a handle, the truss is held over a fire without smoke, and kept moving about so as to roast the whole equally without burning, on the success of which operation the quality and flavor of the article much depends. When successfully roasted the raw vegetable taste is entirely dissipated, which is not the case if insufficiently done. When singed or overdone, the extract is destroyed and the aroma lost. When the fire is smoky, the flavor varies with the nature of the smoke. The stalks are roasted equally with the leaves, and are said to add fully as much to the strength of the infusion. By roasting, the whole becomes brittle, and is reduced to a coarse powder by rubbing between the hands. In this state it is ready for use, and the general mode of preparing the beverage is by infusion, as in the case of common tea.

"If the testimony of one who has been long personally accustomed to the use of an infusion of the coffee-leaf thus prepared, can be of any avail in recommending the article to public notice, I freely offer mine in support of all that which Dr. Gardner's patent claims for it, viz., 'as forming an agreeable, refreshing, and nutri-

tive article of diet.' While I find the use of infusion of the *berry* for a few days invariably to produce on me, as on many others, the effects of nervousness and bilious obstruction, I drink a strong infusion of the *leaf* daily with evident benefit to my health and strength. As a restorative on exhaustion from the severities of labor or of the weather, from heat to cold, or long exposure to rain, I know nothing superior to it. It has also the advantage of being a powerful disinfectant, so far as neutralizing fœtidity goes, and a solvent of the viscid fluids which obstruct the circulation, often to the extent of becoming laxative if taken in extra quantity. Of its nutritive power, no proof can be stronger than that it suspends hunger and enables the laboring man to pursue his work for hours after he would be otherwise unable. That it would soon become a most valuable article of diet among the laboring classes, and on ship-board particularly, if once brought into use, there can be no doubt. The coffee-tree can be grown to advantage for the leaf in the lowlands of every tropical country where the soil is sufficiently fertile, whilst it requires soil and climate to produce the fruit.

"Nothing appears in the *Free Press* on the mode of its preparation by Dr. Gardner, but I should think if roasted and pulverized and packed in air-tight cases like tea, it would retain its strength and bear transporting to every part of the world; and as it soon fixes itself more strongly than either tea or coffee in the taste, it would soon become a more absolute necessary of life than either of those articles. In fact, I am acquainted with no tropical production capable of being rendered so great a blessing to mankind as the coffee leaf; and as it would tend materially to the desuetude of ardent spirits and strong drinks, its introduction ought to have the support of every friend to the moral and material welfare of society."

Padang, 12th Nov., 1852. *Pharm. Journ., March*, 1853.

ON THE STATE OF PHARMACY IN GERMANY AND PRUSSIA.

By M. Bussy.

Among the modifications of the law relating to pharmacy, which have been sought for in a petition addressed to the French government by a great number of pharmaceutists, there is one of especial importance, to which all the others are in some sort subordinate.

This is the limitation of the number of Pharmacies and the establishment of a legal tariff for the sale of medicines.

The consideration of this petition was entrusted by M. Dumas, then minister of agriculture and commerce, to a commission consisting of MM. Soubeiran, Boudet, and Bussy, the latter of whom, in order justly to appreciate the advantages and inconvenience of the system desired, has undertaken the examination of its practical working in the several German states were it has existed from time immemorial. On account of the interest of the question which has thus been raised, he has published the result of his inquiry and the opinions he has formed of the different systems which now obtain in France and Germany.

The medical institutions of Germany are for the most part modelled after those of Prussia. In the free towns and small states which do not possess a special Pharmacopœia, that of Prussia is invariably adopted.

This circumstance is owing not merely to the greater territorial importance of Prussia and its political influence over the smaller states, but is in a great measure the result of the especial care which that power bestows upon every subject connected with the public health.

It will, therefore, be convenient to give particular attention to the institutions of that country, the administration and political organization of which, in many respects, closely resemble that of France.

Medical legislation in Prussia is centralized under the management of a single minister, whose supervision extends not only to Medical and Pharmaceutical affairs, but likewise to everything connected with the exercise of these professions, midwives, dentists, veterinarians, and all that relates to public medical institutions. He has under his immediate authority a superior medical council at Berlin, and in each province a government medical adviser charged with the administration of all medical affairs.

Besides the government medical advisers there are other functionaries, who, under the titles of "physicus" and "kreis-physicus," are charged with the surveillance of medical affairs in towns and districts, and all the details relative to the execution of the special laws and regulations of the medical professions. Questions of a purely scientific nature are submitted at Berlin to

a kind of medical board, appointed by the minister. In this board all the medical sciences are represented, and it is presided over by a superior medical functionary.

Similar boards, under the name of medical colleges, are located in the principal towns of each province in the kingdom. The members of these colleges are charged with the examination of surgeons, sanitary officers, and midwives. They are, moreover, called upon to give their advice in all difficult cases of medical and chemical jurisprudence, as well as in all instances where the local authorities consider it necessary to have recourse to their guidance. The higher administrative body is thus made perfectly familiar with all the facts which it is necessary they should be acquainted with, and upon which they may be called upon to give a decision. It will readily be understood how much this system of centralization tends to facilitate the better co-ordination of medical services by the administration, and what a much greater power it gives them of introducing such modifications or improvements as may be considered necessary or practicable. Such then is the general character of the medical organization in Prussia; and it will now be necessary to see in what manner the practical application of the system is carried out with regard to matters particularly connected with pharmacy.

CONDITIONS OF THE EXERCISE OF PHARMACY IN PRUSSIA.

In Prussia and in the several German states it is necessary, in order to exercise the profession of a pharmaceutist, to possess the following qualifications:

1. An adequate education proved by preliminary studies and special examinations.

2. An authority to open a shop, or to undertake the management of one already established.

STUDIES AND RECEPTION OF PHARMACEUTICAL CANDIDATES.

A young man who is desirous of entering a pharmacy for the purpose of learning the business, must but be at least 14 years of age. He must have a sufficient knowledge of Latin to be able to translate the Pharmacopœia at sight; and further, he must be acquainted with the first elements of the physical and natural sciences. He shows that he is possessed of these qualifications by an examination, which is made by the "physicus" of the district.

The "physicus" gives the candidate, who passes, a certificate stating that he has conformed to the usual regulations; he is then considered capable of entering a pharmacy, and receives from the certificate the authority to do so. The prescribed period of study as an élève is four years; but this period may be shortened six months by special permission from the pharmaceutist, when the élève has distinguished himself by aptitude and industry. At the end of this time he undergoes another examination by the "physicus" and the pharmaceutist with whom he has studied. On passing the examination he receives a second certificate, stating that he possesses the requisite knowledge and is capable of being employed as a "commis." Before he can present himelf for examination to be admitted as a pharmaceutist, he must have served during five years as a "commis." The system of education of élèves in Germany differs therefore in some respects from that which is adopted in France. The preliminary examination which they undergo by the "physicus" is very advantageously replaced in France by the diploma of "bachelier ès sciences," required of pharmaceutical élèves.

However, while the French law recognizes only one class of pharmaceutical students, the Prussian law wisely makes a distinction of two classes—the one comprising those who are passing through what is elsewhere called the apprenticeship, and the other including the "commis," who, properly speaking, correspond to the "élèves en pharmacie" in France.

Upon this distinction, which is extremely appropriate, depends in a far greater measure than might be supposed, the good management of the business; it involves a difference in the respective duties of the principals and the élèves, the maintenance of which is highly important. Thus a pharmaceutist may have an unlimited number of "commis," but the number of apprentices is limited, and must always be less than the former; he is bound to provide the apprentices with the necessary facilities for pursuing their studies and to assist them with his advice and instruction. It would certainly be advisable to resume in some respects this system in France; it would be advantageous to re-establish the distinction inappropriately abolished between the élève who is commencing his studies, and whose intervention in the actual business of the pharmacy may be hazardous, at least when not

scrupulously watched, and the élève who has already had more than four years' practice, to whom may be intrusted a great number of operations, and, in case of necessity, even the superintendence of the business during any temporary absence of the principal.

In fact, pharmaceutists draw a marked distinction between their élèves; and although this distinction is not authorized by law, it would be very advantageous if it were.

Under the general denomination of élèves, a pharmaceutist may have only such apprentices as are entirely ignorant; and if in case of momentary absence he were to entrust the business to one of them, great inconvenience might result. It is therefore requisite that the government should establish a legal distinction between the élèves—between those who, on account of their want of experience, are unable to carry out any operations except under the immediate superintendence of the principal, and those who are sufficiently instructed to be capable of assisting, or, in case of necessity, replacing him. The latter might with justice assume the title of "aides en pharmacie," leaving to the former the denomination of élèves. Such a measure would be conformable with the true state of things, and would at the same time establish a better internal organization of pharmacies, rendering them more easy of management and of greater service to the public.

In Prussia, as in France, the pharmaceutical candidates are not strictly compelled to pass through a course of study at a university before presenting themselves for examination; but in both countries the necessity has been felt of altering this state of things, and making theoretical studies obligatory, long experience having demonstrated that candidates who have not passed through a regular course of study are altogether incapable of undergoing examination with any chance of success.

The Prussian law requires that the candidates shall have had nine years of practical experience, that is, four years as élève (apprentice) and five years as commis (assistant;) but this term of nine years can be abridged in the case of those élèves who have attended a university course.

There are not in Germany, as there are in France, any special schools of pharmacy; the pharmaceutical élèves, like the students of medicine, law, and others, are educated at the universities, where they are taught in a general manner without any reference

to practical applications. Such a combination of all the sciences in one institution certainly possesses very great advantages, especially for small states. They are thus enable, by concentrating all their means upon one establishment, to provide students with the means of obtaining a general education of an elevated and far more complete character than could be done if the different educational establishments were distributed among several cities. But these universities, useful in certain respects, where law, theology, natural science, mathematics, &c., are taught, are incapable of replacing with advantage the institutions for professional instruction, organized in a special manner in France, under the names of the Faculty of Medicine, School of Pharmacy, School of Mines, &c., where the sciences are taught with a direct view to their applications. Taking, for the sake of example, only one science—taught in three schools of which mention has been made—chemistry, it will readily be understood, that it is presented in each of them under very different points of view, and that the general course adopted for the mixed audience of a university, comprising students of pharmacy, medicine, agriculture, and mining, would not fully supply the wants of any one of these classes of students. Nevertheless, it would be unjust not to acknowledge, that with regard to chemistry in particular, it is studied in Germany with very great care, and with considerable advantage to the students.

The course of study which they are required to follow at the University of Berlin, in the place of a part of their practical studies, comprises botany, physics, chemistry, and pharmacology, natural history, and chemical analysis. The student pays the professor one or two louis for the course of each session, and in return for this he is admitted to work in the laboratory of the professors of chemistry, where he acquires a knowledge of analysis. The same regulations are observed in the other univerities of Germany.

When a candidate is desirous of being received as a pharmaceutist, he addresses to the competent authority—the minister of public instruction, &c.—a request to that effect, which must be accompanied by documents proving the length of time during which he has studied. If these documents are satisfactory, the candidate receives from the minister an authorisation, in which he is reminded of the different conditions with which he will have to comply.

This authority having been obtained, it is addressed to the director of the university, whose business it is to convoke a board of examiners. This board is composed of eight members, who at the present time are Mitscherlich, Professor of Chemistry; Rose, Prof. of Chemical Analysis; Bran, Professor of Botany; Magnus, Prof. of Physics; Kluge, Professor of Zoology; Berg, Stabero, and Wittstock.

The examination is extended, stringent, and varied.

The first part, under the name of the "tentamen," is a kind of preliminary test, and relates to three subjects, mineralogy, botany, and toxicology, of which the candidate is obliged to treat in writing.

The second part consists in the preparation of a certain number of galenical substances under the superintendence of a member of the board.

The third part consists in the preparation of three chemical products, properly so called, and used in pharmacy, such, for instance, as acetic acid, iodide of potassium, and emetic tartar.

The fourth part is the chemical analysis of some mixture of mineral substances, of which the following is an example:—Oxide of mercury, oxide of zinc, oxide of magnesiun, oxide of calcium, phosphate of lime.

These substances must be determined both qualitatively and quantitatively. The examiners previously fix the limits of error within which the results of the candidates must fall on pain of being rejected and having to recommence their examination.

The fifth part of the examination is likewise an analytical operation; the candidate must determine the nature and quantity of some poisonous substance mixed with a medicinal or alimentary compound. The following examples, taken from records of the board of examiners, will give an idea of the kind of analyses and the difficulties which they present:—1. Emulsion of almonds, six ozs.; corrosive sublimate, ten grs.; white oxide of antimony, ten grs. 2. Café au lait, six ozs.; arsenious acid, six grs.; sulphuret of cadmium, ten grs. 3. Protochloride of mercury, ten grs.; nitrate of silver, ten grs.; liquorice, sufficient to make 100 pills of 4 grs. each.

The recognition of drugs is the object of the sixth part of the examination; and among other things, the candidate is required to

tell the names of and describe six dried plants taken at random from an herbarium containing officinal and medicinal plants.

The seventh part of the examination, and the one to which great importance is attached, is a written composition. This is a work of erudition, usually very extended, upon some given subject connected with chemistry, and capable of considerable development, as for instance the history of cyanogen. The author is allowed as much time as he may require for the completion of his treatise; books as well as all other requisites are placed at his disposal, and he is merely required to state from what source he has derived his information. He thus gives a kind of complete treatise upon the subject, and in so far is obliged to introduce into it whatever degree of learning or personal experience he may possess. He is likewise required to prefix to his treatise a *résumé* of his entire career as a student of pharmacy and science (*curriculum vitæ*,) containing a statement of every circumstance which may interest in his favor either the examiners or the administration.

The treatise, strictly speaking, ought to remain in the hands of the minister, in order that it may be referred to under any circumstances which may affect the pharmaceutist who is its author. Thus, if he makes application for any privilege or other favor which it is in the power of the government to confer, this document is always consulted before a reply is made to his application; it is a "concours" which is in some sort permanent among the pharmaceutists of the country, and which places the government in a position of being always acquainted with the former merit and claims of each individual.

In the eighth stage of the examination, the above-mentioned treatise is submitted to the test of public discussion, in which the examiners take part. At the same sitting, which terminates the examination, the candidate is or may be interrogated on all branches of science connected with pharmaceutical studies. This part of the examination is public, the rest takes place in the presence only of three members of the board of examination.

When the candidate does not perfectly satisfy the examiners in any part of the above examination, he is required to present himself again after a certain time determined by the examiners; when, on the contrary, he is found to possess the necessary qualification, he is admitted without delay, and receives his diploma at the close of the examination.

The board at Berlin examines candidates from all parts of the kingdom; besides it, there are similar boards in the chief towns of each province, taken from the medical colleges, who likewise admit pharmaceutical candidates by examination, although only those of the second class, whose privileges are very limited.

The examination by these deputy boards is nominally the same as that at Berlin, but is really much less severe. The manipulations are conducted in the shop of one of the examiners, and never present the difficulties and importance of those required by the board at Berlin. The entire examination does not occupy more than three sittings.

The admission of pharmaceutists in Prussia, as may be inferred from the above, is an extremely serious transaction. The written treatise, which is not required in any of the examinations in France, is a very requisite and trustworthy test; the most timid candidate, however little used to speaking in public, may, by this means, furnish a certain indication of the extent of his knowledge, without his attention being distracted by any external circumstances, and leaves the examiner perfectly at liberty to be strict without fearing to be unjust, by attributing to deficient knowledge any hesitation or error which may be solely owing to momentary confusion or nervousness. The chemical and toxicological analyses are likewise tests whose introduction into the examination is indispensably necessary. The candidate may indeed have given very satisfactory answers on chemistry, but his theoretical knowledge will remain useless in the exrcise of his profession—it will be of no service either to himself or to the public, unless based upon a sound practical experience. It is necessary not only that he should know processes, but likewise that he should know how to conduct them practically.

Under the pressure of this necessity of undergoing a practical examination, a great number of the pharmaceutists of Germany have, by their studies in the laboratories of Giessen, Berlin, and Weisbaden, become very dexterous manipulators, who may safely be consulted by the judicial authorities in any cases of medical jurisprudence, and to whom manufacturers and agriculturists are in the constant habit of referring for scientific assistance.

THE TWO CLASSES OF PHARMACEUTISTS IN PRUSSIA.

In most of the German states there is only one class of phar-

maceutists, but in Prussia there are two; those who are admitted by the examiners at Berlin, and those who are admitted by the provincial examiners. The latter correspond, with regard to their modes of admission, to the pharmaceutists admitted in France by the "jurys medicaux," but in Prussia they possess but very limited privileges; they are fewer in number, are not held in any estimation in a professional point of view, they cannot be consulted by the judicial authorities in cases of chemical or toxicological jurisprudence, and they are only permitted to establish themselves in neighborhoods where the population is very small; they are, in fact, altogether in a position of marked inferiority to the other class of pharmaceutists, who are at liberty to establish themselves anywhere. The law does not strictly determine the amount of population of the towns in which pharmaceutists of the second class may establish themselves, but in practice this circumstance is not found to involve any difficulty, for the Government always gives the preference to pharmaceutists of the first class. Consequently, whenever there is a competition for the esablishment of a Pharmacy, or for the management of one already existing, permission is not granted to a pharmaceutist of the second class, if it is at the same time applied for by one of the first class. By this means there is never any want of qualified pharmaceutists suitable to the requirement of the population of a locality, and when it is necessary to make a choice among competitors the permission is always granted to the most worthy.

This system is by far more rational than that which prevails in France, where the pharmaceutists admitted by the jurys are at liberty to commence business in any town they please, with the exception of Paris, Montpellier, and Strasburg. The consequence is, they establish themselves in the large towns, together with pharmaceutists of the first class, while in the smaller places there are none at all. It would certainly be very desirable if there were in France, as in all other countries, but one class of pharmaceutists, so that the poor, as well as the more wealthy population, the inhabitants of the country places, as well as those of towns, might have their wants supplied by men of equally good education. But if, on the other hand, the inferior order of pharmaceutists are tolerated, upon the ground that such a course is to the interest of those inhabiting small towns or villages, and alone secures to them

a supply of medicaments in case of necessity, it must be allowed that this object is altogether frustrated, by granting them permission to establish themselves in large towns, or in any place where pharmaceutists of the first class should settle.

It would therefore be just, and at the same time advantageous to the country, if, as in Prussia, the preference was always given to those who can present the greatest guarantee of capacity, and if pharmaceutists of the second class were permitted to establish themselves only where the number of those of the first class was inadequate to the requirements of the population.—*Pharm. Jour.*, May 1, 1853, from *Journ. de Pharm.*

(To be continued.)

NOTES UPON THE DRUGS OBSERVED AT ADEN, ARABIA.

By James Vaughan, Esq.

Member of the Royal College of Surgeons of England, Assistant Surgeon in the Bombay Army, Civil and Port Surgeon at Aden, Arabia.

Communicated by Daniel Hanbury.

(Concluded from page 234.)

Copal.—This substance is brought from the coast opposite the island of Zanzibar and is said to be dug up from the earth, where it lies in irregular flakes.

The mines, if they may be so called, are worked by Seedees exclusively for the Imaum of Muscat, who is also the ruler of Zanzibar, and claims the produce as his private property. I have heard that in the same latitude (or nearly so) on the western coast of Africa, somewhere in the region of Congo, similar beds of this substance are found and worked by the Portuguese.

Sanguis Draconis, or Dragon's Blood, is known in Southern Arabia and Socotra, as also among the Somalis, by the name of *Dam-oolakhawein*, i. e., *the blood of the two brothers.* In the island of Socotra the tree affording it grows in luxuriant abundance together with the plant yielding aloes. It is likewise to be found in Hadramaut and on the east coast of Africa, though but little of the drug is exported from the latter places, the natives being either ignorant of its uses and value, or too supine and lazy to collect it.

Dragon's blood, aloes, orchella weed and ghee, or liquid butter, are the principal and almost the only exports from Socotra. These are generally taken by the *baggalas* and native vessels which

arrive there annually from the Persian Gulf about the month of February, after having touched at the principal towns on the coast of Southern Arabia, bringing with them dates (which are the staple commodity,) small parcels of cloth, rice, sugar and iron, all which they barter for the native produce. The boats next proceed to Zanzibar where they dispose of the articles obtained at Socotra and which are thence transhipped for the Indian markets; they then return laden with grain and other merchandize about the month of April, revisiting for the usual barter trade several of the towns on the Arabian coast, and reaching the Gulf about the end of May.

A naval officer of great experience informs me, that whilst at anchor in the Muscat roads, between the 21st November and 10th December, 1835, he calculated from the number of native vessels which passed that port sailing westward and varying in size from 50 to 252 tons, that the freight of dates amounted to at least 12,880 tons. This fact alone indicates that an extensive commerce is kept up between the Persian Gulf, Southern Arabia, Socotra and Zanzibar.

Hitherto very little Dragon's blood has been imported into the Aden market, but as has already been remarked with regard to other drugs common in this region, the demand only seems wanting to call forth a plentiful supply.*

Dugga-boot or Dagaboot, a medicinal root growing on the Somali coast. The natives of that part of Africa make use of it in nearly every ailment but especially for pain in the bowels, anorexia, and debility after fevers. From this I imagine it is an alterative tonic, but beyond this crude information I am unaware what the beneficial properties of the root are.†

* Lieut. Wellstead speaks of having observed *Dragon's Blood* produced in Southern Arabia as well as in Socotra. The tree affording it he states to be *Dracæna draco*, and from his description it would appear likely that such is the case. See *Travels in Arabia*, by Lieut. J. R. Wellstead, F. R. S., Lond., 8vo, 1838, vol. ii., p. 449. Mr. Vaughan's specimen of *Socotrine Dragon's Blood* I have not yet had the privilege of examining.—D. H.

† Mr. Vaughan has alluded to this drug in the *Lancet*, Jan. 10, 1852, p. 41. A specimen of it with which he has favored me, consists of straight, hard, wiry sticks, six to eighteen inches in length, and varying in thickness from that of packthread to that of a quill; externally covered with a thin reddish brown bark, internally whitish. The drug has but little taste or smell.—D. H.

KOBARIMA CARDAMOM (Pereira*,) *Kheil* or *Khil* of the Arabs. The fruit is met with in the market of Mussowah, whence I have obtained through a naval friend a considerable quantity as a specimen. Each fruit has been perforated, probably for the purpose of suspension on a cord while being dried. The drug could be procured in abundance were there a demand for it in commerce.†

WURRUS or WARAS, a red powder used chiefly as a dye, is the produce of a plant resembling the Sesame. I am informed, that the plant rises to about five feet in height, bearing separate bunches or clusters of small round seeds, which are covered with a description of pollen or flour; this, removed from the seed-clusters by gentle rubbing or shaking, constitutes the dye; the seeds are afterwards thrown away. Two kinds of *wurrus* are brought into this market. The best comes from the interior, principally from the towns of O Badan and Gebla and the districts of Yaffaee and Sjibul Rudfan. A second kind, brought by the Somalis of the opposite coast, comes from the neighborhood of Hurrer; this is not so much valued and does not realize the price of the other sort. A considerable quantity of the dye I find is exported to Bombay; it is used principally by the people of Surat for the purpose of imparting a light brown yellow color to their silks, which are much prized and worn by the native ladies. I believe that *wurrus* is used for silks only, and not for cotton or woollen stuffs. Besides being employed by the Arabs of this part as a dye, the color produced being highly esteemed, they use it likewise as an internal medicine in cases of leprosy, and externally in solution as a lotion to remove freckles and pustules. Much of this dye finds its way to the Persian Gulf, where it is known under the name of *Asberg*. *Wurrus* sells in Aden for about twenty-four *rupees* the *maund*, but the African or inferior description realizes only from seventeen to eighteen *rupees* the *maund*.‡

* *Elements of Materia Medica and Therapeutics*, vol. ii., p. 1136 (edition 1850.)

† I am indebted to Mr. Vaughan for an abundant and fine specimen of this rare cardamom.—D. H.

‡ *Wurrus*, of which two samples have been received from Mr. Vaughan, consists of a dull red, granular, sand-like powder, mixed with small fragments of stalk, leaves, &c.

I presume it to be the *Uars* of Niebuhr, which he speaks of as "herbe qui teint en jaune et dont on transporte quantité de *Mokha* dans l'*Oman*;" vide *Description de l'Arabie, Amsterdam et Utrecht*, 1774, 4to. p. 133.—D. H.

Orchella Weed, called *Shenneh*, is abundant in this part of the world. There is any quantity of it on the Somali coast, but of an inferior quality to that collected in Aden and in the neighborhood of Mocha. Latterly the Somalis have brought a quantity for sale, but as yet there are but few purchasers.*

Civet.—Two kinds of civet, known by the respective names of *Zanzibar* or *Sowhale Civet*, and *Mussowah* or *Abyssinian Civet*, are found in the Aden bazaar. A considerable quantity of this highly-scented perfume is annually brought into Aden for sale, there being a constant demand for it by the Arabs of the interior, who greatly esteem it. It is principally employed by the females, who consider it the height of politeness and gentility to be strongly perfumed with it, especially on great occasions and when going into company, so that the odor to the olfactory nerves of an European is often far stronger than what would be agreeable. The men put a small quantity in their turbans, only, and as a rule on no other part of their dress. Very little civet is exported, I believe, from this place by sea, nearly the whole being sent inland or used by the Arabs in Aden.

I find it is no uncommon custom for the natives of India who are in the habit of retailing this scent to adulterate it to a considerable extent with rosin and with the pulp of the plantain. The *Zanzibar* or *Sowhale civet* sells here for 1¾ dollars per *ounce*, and the *Mussowah* or *Abyssinian civet* for about one dollar per *ounce*. Civet is brought for sale in large buffalo horns each containing from one to two pounds of the perfume.

Ambergris.—Small quantities of this substance are collected on the Arabian coast and brought to Aden, where it sells for 95 *rupees* the pound. I am not aware that it is used medicinally by the Arabs of this district, but it frequently forms an ingredient in the aphrodisiacs employed by the Turks.

Sumn el Baar, *Fat of the Sea*.—A colorless substance, emitting

* Samples of Orchella weed of three qualities have been forwarded to England by Mr. Vaughan, viz.:

1. *Shenneh from Socotra, first quality*. This consists of *Rocella fuciformis*, De Cand.

2. *Shenneh from Socotra, second quality*, consists of *Rocella tinctoria*, De Cand., *Rocella fuciformis* and (?) *Parmelia perlata*.

3. *Orchella collected in Aden*, consisting entirely of *Rocella fuciformis*. An orchill manufacturer who has examined it, finds it to afford a fair amount of coloring matter.—D. H.

a very powerful and offensive odor, which is frequently brought into Aden in large masses, sometimes of the weight of twenty pounds. It is found on the beach or floating on the sea all along this coast. To all appearance it is the produce of a cetaceous animal, most probably of a whale or a dolphin, of which it seems to be a portion of the blubber whence a great part of the oily matter has oozed out. The specimens which I have examined consisted chiefly of fibro-cellular tissue enclosing but a small quantity of spermaceti. The Arabs use it, when melted over a slow fire, as an unguent, and consider it almost in the light of a specific in rheumatic affections.

Pearl-ash.—An impure carbonate of potash in large dark or black circular cakes is brought into the Aden market every day, and extensively used in washing clothes, &c., being much cheaper than soap, and because it saves the native *dhobies** the expenditure of what a laundress at home calls "elbow-grease," a species of manipulation to which they are much averse. The wood affording this alkali grows in the immediate neighborhood of Aden, and the process of combustion is constantly going on along the northern shore of the harbor. I find the Aden washermen pay about two rupees for each cake.

The foregoing sketch, imperfect as the writer knows it to be, affords, nevertheless, ample proof that this region abounds in numerous vegetable productions, which are profitable as articles of trade, and valuable in their medicinal and other uses. With some of these the commercial and scientific world are already acquainted, with others they are less familiar, and of a few it may be presumed that they know scarcely anything. With regard to science, and especially medicine, it is much to be regretted that some eminent botanist does not turn his attention to this part of the world, where Nature has been so lavish in her precious gifts, and where a wide field of research is open to him, from which he might make many important and original additions to the present stock of medical knowledge, and thereby establish a high claim to the esteem and gratitude of his profession in particular, and of the scientific part of the community generally. Scarcely anything is known at present of Eastern Africa beyond the sea-board, and the

* *Dhobies*, Indian washermen.

same remark applies to Southern Arabia. What little is reported of the former country goes to support the anticipation, that it is rich, not only in such productions as coffee, cardamoms, gum arabic, gum mastic, myrrh, frankincense, manna, orchella, saffron, safflower, and other familiar drugs, such as have been enumerated in the foregoing paper; but also in a variety of shrubs, plants, and flowers, possessing properties which eventually might prove a great blessing to mankind. And with regard to Southern Arabia, famous even in the early ages of the world for its valuable vegetable produce, it appears almost unaccountable that this country should be well nigh as little known to us as it was to the learned in the days of the ancient Greeks and Romans.

Science may justly be styled the handmaid of trade, and in proportion as general information and civilization extend in this part, will trade increase and thrive. On the other hand, trade is already opening the road for researches such as I have recommended, and a traveller may now make his way with comparative ease to places which, a few years ago, would have been pronounced incapable of access to the European.

Since Aden was declared a free port, the concourse of natives here from the opposite shores of Africa and from the sea-coast of Southern Arabia, has considerably augmented,—a satisfactory proof that trade is on the increase; and I am persuaded that, under judicious management, Aden bids fair to become the great mart of this part of the world. As these visitors and strangers learn more of our habits, and begin to apprehend that their own interests are in a measure bound up with ours, they will gradually lose their jealousy, and eventually become our guides to the homes which they inhabit. This nearer approach to us increases year after year, and the hope may be reasonably entertained, that the present generation of Somalis and Arabs who frequent Aden will not have passed away, before the skill and energy of Europeans shall have availed of this favorable feature to penetrate into their country and to explore its now hidden resources and treasures.

With regard to the general commerce of this region, I trust that the time is not distant, when British merchants will deem it worth while to inquire what prospects it holds out for successful speculation. America and France are before them in the field, and although I cannot assert how far their efforts have been prosperous,

yet the simple fact that they are able to carry on business here, and the other point which I have already stated regarding the increase of trade generally in these parts, may justly be regarded as sufficient criteria to warrant attention being called to the subject.

If the foregoing remarks shall in any degree tend to awaken interest, either in the lovers of science or in the mercantile community, and thus pave the way to the acquisition of the least benefit, the imperfect attempt of the writer will be more than compensated.—*Pharm. Journ.* Feb. 1, 1853.

ON THE TESTS FOR THE CINCHONA-ALKALOIDS, KINOVIC ACID, KINIC ACID, AND OXIDIZED TANNIN (CINCHONA RED,) IN CINCHONA BARKS.

By Dr. F. L. Winckler.

Of all long-known drugs none have in recent times so much engaged the attention of Chemists as cinchona bark—the discovery of the various alkaloids contained in it having afforded a safe standard for the determination of its goodness.

This circumstance has been accompanied by a large number of results, which are of great importance in medical practice. It has removed the uncertainty of the notion of genuine and spurious barks, and made it possible to distinguish the former from the latter, and to determine their real value.

The excellent work of Von Bergen forms the foundation of our knowledge of the cinchona barks. Its theoretical part contains everything that could be obtained at the time of its appearance; but Von Bergen's account of the mercantile relations of this drug is of greater value, because nothing certain was known on this point before, and because for the medicinal use of barks an accurate knowledge of the material imported is certainly of greater importance than the origin of the barks. Notwithstanding all our present information, a long time must elapse before we can accurately arrange the barks imported into Europe, because in consequence of the greatly increased consumption, for the purpose of obtaining the alkaloids, new sources are rendered necessary, and new districts in the native country are explored, by which, doubtless, new species of cinchona are discovered.

The correctness of this view is shown by the present occurrence

of a considerable number of barks which were hitherto unknown; as for example, the barks containing quinidine and paricine, and the numerous sorts of the so-called yellow barks; and it may without hesitation be asserted that these barks contain also a larger number of alkaloids than is known at present.

I have read with much interest Weddell's excellent work, from which Dr. Riegel some time since extracted (see Pharmaceutical Journal, vol. ix., p. 224) the information which is of most importance to the Pharmaceutist. Although I am far from undervaluing the high merits of this distinguished traveller, the successor of Humboldt and Poppig, I am, notwithstanding, of opinion that too great importance must not be attached to his researches. I consider that his proposal to determine the goodness of barks by their anatomical structure, has no greater value than as an application to botany generally, and to vegetable physiology in particular, for I have convinced myself by numerous and most carefully performed experiments, that his assertion, that the shortly fibrous barks contain the largest proportion of alkaloid cannot be admitted, as its truth has been directly disproved. It is only applicable to calisaya bark, and even in that case has many exceptions. Were this alone sufficient to raise doubts about the possibility of judging of the goodness of barks by their structure, there is also another circumstance to be taken into consideration. The anatomical structure of bark is, as is well known, uninterruptedly progressive during vegetation: each stage offers a new formation, the bark of the trunk appears very different from that of the larger branches, and that of these varies again in its structure from the bark of the smaller branches. Lastly, we ought to examine the barks as Weddell did, in their fresh condition, in order to be enabled to judge of their structure. These views of Weddell's, however interesting they may be in other respects, are, I am convinced of a very subordinate value for medical practice. We must, therefore, still follow the chemico-analytical route, if we wish to establish a scientific and safe classification of the cinchona barks.

Dr. Riegel was no doubt of the same opinion, when he appended to his extract from Weddell's work a synopsis of all the known methods of determining the proportion of alkaloids; and I am much surprised how he, under these circumstances, could express some doubts whether my experiments perfectly agreed with Weddell's

statements about the origin of the barks, which was scarcely possible. All my experiments refer only to commercial barks, by the names under which they occur in commerce, and I have described their physical characters. Weddell, on the other hand, had quite another object in view, namely, the origin of the barks; and he made no comparative chemical investigations of them. Nevertheless, he, like his predecessors, has left us in uncertainty about the origin of many commercial barks; for I can never persuade myself that Loxa bark and the woody Carthagena bark are derived from the same mother-plant, Cinchona condaminea; and every one who knows and has chemically examined both barks, will perfectly agree with me.

We ought, therefore, while fully acknowledging Weddell's merits, not to overlook the difficulties of the subject. It would be unjust to expect that a traveller struggling with hardships of every kind should perform chemical experiments on the spot. This would be contrary to the purpose of so great an undertaking.

My object has hitherto been to arrange the commercial barks according to the specific proportion of alkaloid which they contain, as I have already done, in a small treatise.

There is indeed nothing that could materially obstruct such an arrangement, especially as by the discovery of the kinates we are enabled easily to distinguish similar spurious barks from genuine ones, whilst every uncertainty may be removed by one single experiment. Discrepancies like that which Reigel has noticed with regard to the chemical constitution of Pitaya or bicolorata bark, depend on the mistaking of one bark for another, which frequently arises from the employment of erroneous names. The bark which Peretti examined as Cinchona bicolorata, cannot be identical with that whose alkaloid richness, Muratori determined. According to Peretti, and his experiments agree with mine, the bark which he examined contained a peculiar, amorphous, uncrystallizable alkaloid (Peretti's *Pittayin*) and is *decidedly no cinchona.*

As regards the testing of cinchona barks for the alkaloids, no notice has hitherto been taken of the proportion of kinovic acid, but as the very bitter taste of the spurious cinchona barks depends exclusively on this acid, and in some of the genuine barks kinovic acid is found, a mistake may be easily made by the taste. I have

for several years past, devised and employed a method by which not only the proportion of the alkaloid, but also that of the kinovic acid may be quantitatively and qualitatively determined, whilst at the same time the proportion of both kinic acid and oxidized tannin (cinchona red) is indicated. So that all those constituents of the bark, which are of importance for medical practice, are determined.

The barks tested by this method, yield, when employed for the manufacture of the alkaloid on a large scale, exactly the same quantity which they yield by the experiment, generally one-eighth to one-quarter per cent. more, the loss in working with large quantities being naturally less in proportion, and this indeed is the best proof of the efficiency of this method.

In the qualitative examination of cinchona barks, a number of tests have hitherto been employed, which have not only [not] aided this examination, but have rendered it much more difficult.

The efficacy of the bark depends, as is well known, chiefly on the proportion of alkaloid, and of that of pure and oxidized cinchona-tannin. Of the kinovic acid, we only know that it does not act as a febrifuge. The medicinal virtues of kinic acid or kinate of lime have not yet been determined. We must, therefore, confine ourselves to the application of those tests by means of which these compounds can be detected in an infusion of bark, and their quantitative proportion at least approximatively determined. These are, as has been before stated in my monograph on genuine barks, as follows:—

1. *Tannin*, for detecting the alkaloids. The more abundant the precipitate produced by this reagent in the aqueous filtered infusion, the more alkaloid do the barks contain.

2. *Chloride of iron* determines the proportion of oxidized tannin by the more or less intensely dark-grey coloration, which speedily becomes brown, and by the subsequent more or less abundant pulverulent precipitate of a dark, dirty, brownish-green color.

3. *Gelatine* (*solution of isinglass*,) like chloride of iron, occasions the oxidized tannin to be precipitated. In the liquid filtered from the magma, the proportion of non-oxidized cinchona-tannin may be determined by iodic acid. The latter oxidizes the tannin, and causes the precipitation of a yellowish brown

powder; the mixture soon smells of iodine. The quantities of these two precipitates show the proportion of oxidized and of pure cinchona-tannin.

4. *Sulphate of copper* is perfectly indifferent to the aqueous infusion of bark, which contains no kinovic acid, but indicates the smallest proportion of this acid by a dirtyish green coloration of the mixture, which is speedily followed by a similarly colored fine powder, which is easily separated by the filter, and, after being washed, is distinctly recognized by its very bitter and metallic taste, as kinovate of copper. The more abundant this precipitate, the greater is the proportion of kinovic acid. All other reagents hitherto employed can be absolutely dispensed with.

Of all the hitherto known methods for the quantitative determination of alkaloids, I prefer the following:—If the quantity of bark at command be large, it is necessary, in the first place, to ascertain whether it consist of one or of several sorts. An experienced eye can readily determine this. The several sorts should be separated, and, for experiment, not too small a quantity selected from the entire mass of the coated and uncoated of the coarser and finer barks, taking of each sort according to the various dimensions in which it is contained in the whole mass, about an equal weight. These pieces are to be finely powdered and the residue mixed with the powder. Of this powder 500 grs. or 1000 grs. are to be completely exhausted by digestion in the water-bath, with the necessary quantity of alcohol of eighty per cent. (I use six ounces of alcohol for 1000 grs. bark;) the cold tincture is to be strained through a thin but close piece of linen, the residue washed with alcohol and again digested, and completely exhausted with half the weight of the first employed quantity of alcohol. The residue which is now obtained is to be once more exhausted by alcohol, then dried and preserved. (There is no occasion to spare the alcohol in this process, as the greater portion of it is recovered.) The united alcoholic tinctures are to be filtered and digested at the common temperature, with a mixture of equal parts by weight of recently prepared slacked lime and of crude well-burnt animal charcoal, of which in general half the weight of the employed bark is required. The mixture is to be frequently shaken, and the digestion continued until the

supernatant liquid becomes perfectly decolorized. In the case of most of the genuine barks, this takes place in a short time; but the alcoholic tinctures of the spurious barks, which contain kinovic acid, as well as those which contain paricin, are very imperfectly decolorized by this process, a circumstance which serves to distinguish the paricin barks and spurious barks from the genuine ones.

The decolorized liquid is now to be removed from the residue, and the latter repeatedly shaken with small quantities of alcohol washed on the filter with spirit of wine and dried. From the mixed filtered alcoholic tinctures the greater portion of the alcohol can be recovered by distillation in the water-bath. Beindorff's distillatory apparatus with Liebig's refrigerator is well adapted for this purpose—a similar and much cheaper apparatus can be constructed of tin. The whole quantity of alkaloid which was contained in the bark is now in the residue, and, if the bark contained kinovic acid, in combination with the latter, and a peculiar fatty substance. Small proportions of oxidized tannin are frequently mechanically mixed with it. In order to purify the alkaloid of the latter and to remove the kinovic acid and fatty matter, the residue is to be placed in a small evaporating basin, the distilling vessel is to be washed with a small quantity of water, slightly acidulated with sulphuric acid, and the solution added to the residue. A small excess of diluted sulphuric acid is to be dropped into this mixture, which is to be heated, and when it again becomes cold is to be filtered, and by this means the precipitated kinovic acid and fatty matter are removed and washed with distilled water. From the filtered acid solution the alkaloid is to be thrown down by a slight excess of ammonia; and the mixture evaporated by a slight heat to dryness. The sulphate of ammonia contained in the cold residue is to be removed by a small quantity of very cold water, and the residual alkaloid dried and weighed in this impure state; for the perfect purification of small quantities is attended with too great a loss to admit of the exact determination of the quantity of alkaloid contained in small quantities of bark. After having thus determined the weight of the alkaloid, the further examination of it is proceeded with, the cinchonine and quinine are seperated by ether, &c.

In order to determine the proportion of kinovic acid, dilute solution of ammonia is to be added to the yellowish, glutinous matter which adheres to the filter, and which is, for the most part, greasy to the touch. This takes up the kinovic acid but not the fat. The solution is to be filtered, and to it a slight excess of muriatic acid added to precipitate the kinovic acid, which is then to be collected on a filter. The well washed glutinous precipitate is to be removed whilst moist from the filter, and dried on a watch-glass or porcelain capsule, and the weight of the thus obtained kinovic acid marked down. This, however, is only the larger portion of the quantity of the kinovic acid actually obtained from the bark. A smaller portion of it is still contained, combined with lime, in the lime residue which has been digested with the alcoholic tincture of bark. This kinovate of lime is very difficultly soluble in spirit of wine.

In order to obtain this smaller portion, the lime-residue, exhausted by alcohol, is to be dried and powdered, and then digested with cold distilled water. From the filtered liquid, which is almost as clear as water, the white and nearly pure kinovic acid is thrown down by a very slight excess of muriatic acid. It is then to be weighed and the sum added to that before obtained. By the direct treatment of powdered bark with milk of lime, the whole quantity of kinovic acid can be extracted from the bark. Also for the quantitative determination of the acid it is advisable to weigh it in the imperfectly pure condition, the loss accompanying the purification being very considerable.

If the qualitative examination of the bark has shown that this substance contains none or only a small proportion of alkaloid, but a large quantity of kinovic acid, or the latter only, the bark is more appropriately first treated with diluted milk of lime, and the kinovic acid precipitated by muriatic acid, by which method the testing of the residue for a possibly slight proportion of alkaloid is considerably facilitated. The dry residue of lime is then exhausted by alcohol, like the powdered bark, &c. In this manner I obtained from sixteen ounces of bark, containing kinovic acid, one grain of cinchonine, besides a large quantity of kinovic acid. The last more important constituent of the bark, the kinic acid, is now easily obtained by exhausting the residue of the bark, which has been treated by alcohol, with cold distilled water, evaporating

the filtered liquid and distilling it in a not too concentrated state with peroxide of manganese and moderately strong sulphuric acid; the least proportion of kinic acid in the liquid is soon indicated by the development and evolution of kinone, which takes place during this process; and the smallest quantity of the kinone, which is not distinctly perceptible by the smell, may be soon detected by the dark color, which the distillate assumes upon the addition of a few drops of a solution of ammonia.

This method of testing barks is distinguished from others by its great simplicity, by the correctness of the results, and by the possibility of detecting and quantitatively determining in one succession, and with the same material, all the more important constituents of the bark; I consider it as the best method known, not because it originates with me, but because it is adapted for the present stage of our knowledge of the chemical composition of cinchona barks, and *is practical.* It may be objected that it is rather troublesome, but this ought not to be of any consideration if we can be but sure of a correct result.

In conclusion, I must observe, that my method, though chiefly adapted for testing genuine barks, can be advantageously applied for examining new and apparently spurious barks. The occurring phenomena will then safely guide the experienced operator. With the barks containing paricine, the separation of the alkaloid is made very difficult, by its forming with the cinchona red contained in the bark, compounds soluble in acids and alkalies, which can be decomposed only with great difficulty. I refer in this respect to my last treatise on the Production and the Chemical Condition of Paricine, in Buchner's *Repertorium.—London Pharm. Journ.*, March, 1853, from *Jahrbuch f. Pharm.*

ON THE PREPARATION AND PROPERTIES OF MAGNESIUM.

By R. Bunsen.

According to Bunsen, fused chloride of magnesium is readily decomposed by the galvanic current. A metallic mass of several grammes in weight may be prepared in a short time with a few pairs of the carbo-zinc battery.

Magnesium obtained in this manner, when freshly broken, is sometimes slightly crystalline and laminar, sometimes finely

granular, or even fibrous, according to the mode in which it is broken; in the former case it is silver-white and very shining, in the latter more bluish-gray and dull. Its hardness is less than that of calc-spar. A moderate red heat is sufficient to fuse it. In dry air it is completely unchanged, and does not lose even the lustre of its surface; but in moist air it is speedily covered with a layer of hydrate of magnesia. Heated to redness in contact with the air, it ignites, and burns with an intense dazzling white light, forming magnesia. The light evolved during combustion in oxygen is of unusual intensity. A piece weighing 0.1 grm., burnt in this gas, gave a light equal to that of about 110 wax candles. As the surface of the burning metal was but small, that of the effective portion of the candle-flame being six or eight times larger, it may be supposed that the intensity of the light of magnesium burning in oxygen gas exceeds that of a candle-flame more than 500 times.

The metal decomposes pure cold water but slowly; water containing acid, however, is rapidly decomposed by it. Thrown upon dilute nitric acid, it ignites instantaneously. Concentrated sulphuric acid dissolves it with difficulty. It is not attacked by a mixture of sulphuric acid and fuming nitric acid in the cold. It burns in chlorine gas when heated previously to its introduction, and also in vapor of bromine, but with more difficulty. Its combustion in the vapors of sulphur and iodine proceeds with greater liveliness. Its spec. grav. at 41° F. is 1·7430. If the atomic value of magnesium be calculated from this, it is found to be twice that of nickel, namely 86 instead of 43. The magnesium obtained by electrolysis may be readily filed, bored, sawn, and beaten out flat, but exhibits scarcely more ductility than zinc at ordinary temperatures, whilst that reduced by potassium is very extensible, and may be hammered out into thin plates. This difference arises from the circumstance that the magnesium reduced by potassium retains a little of that metal; that obtained in the electro-chemical way, on the other hand, nearly always contains a small quantity of aluminium and silicium.

Barium, calcium and strontium cannot be reduced in the same manner.—*London Chem. Gaz.*, from *Ann. der Chem. und Pharm.*

ON THE SUBSTITUTION OF THE CARBONATE FOR THE OXIDE OF SILVER IN COMMERCE.

By Mr. John Borland.

At the present time, when attention is so properly directed to the detection and exposure of adulterations and impurities in many substances used in dietetics and medicine, I beg to be allowed to draw attention to the existence of a fraud which appears to me to be very generally practised with a medicine that is now come into extensive use as a tonic in dyspepsia and other complaints of the digestive organs. I allude to the substitution of carbonate of silver for oxide of silver.

I have carefully examined several specimens, all purchased from different respectable wholesale druggists in London, and have found that each of them, besides being contaminated with the oxides of copper, lead, and iron, contained a large portion of carbonic acid, and effervesced strongly when thrown into diluted nitric acid.

As none of the specimens were wholly soluble in liquor of ammonia, but contained a considerable quantity of some substance insoluble in this menstruum, I was lead to suppose that the evolution of the carbonic acid might be due to the presence of some earthy or alkaline carbonate that had been added by way of adulteration. This, however, after close examination, I found not to be the case, so that the effervescence could not be accounted for in any other way than by supposing the carbonic acid to be combined with the oxide of silver.

That it was carbonic acid, I satisfied myself by holding a watch-glass moistened with lime water above the effervescing solution, when a thin whitish film of carbonate of lime was visibly and quickly formed. I also passed the acid into a solution of pure caustic potass, and on afterwards testing the solution, found it to contain *carbonate* of potass.

In the preparation of this sophisticated article, the manufacturer, I suspect, has employed a solution of the carbonate of some one of the fixed alkalies, in place of its caustic solution, to precipitate the oxide of silver.

The product yielded by this process is consequently greater, as it contains the additional weight of the carbonic acid with which

it is combined,—a sum which is easily calculated if we consider how much the equivalent weight of the carbonate of silver, which is 138, exceeds that of the oxide, which is 116.

The manufacturer who disposes of this at the price of the pure oxide, is thus enabled to realize, besides the legitimate profit due to him as maker of the article, an *additional profit* of a sum equal to the commercial value of about 2½ ozs. of oxide of silver on every 16 ozs. that he sells.

This pecuniary view of the subject should, however, be only of very secondary importance to the dispensing Chemist, whose duty it is *not* to pry into the profits of the manufacturer, but above all to endeavor to serve his customers with a genuine article, and faithfully to carry out the intentions and wishes of the physician who may prescribe for them. Neither of these objects are effected by the dispensing of this or any other adulterated medicine.

In illustration of the difference between the two substances, I shall suppose that a patient receives from his physician a prescription for one dozen of pills, each of which is to contain one grain of oxide of silver. The prescription is with all confidence placed in the hands of the Chemist, to be carefully and properly made up, and the Chemist, either through the cupidity and dishonesty of himself or the manufacturer, or it may be through his own ignorance of, and inattention to the quality of the article supplied to him, in this case, by using the carbonate, makes up the pills with only ten grains of oxide of silver in place of twelve grains.

This difference, it may be said, is not great, but whether it be trifling and insignificant or not, it is no extenuation or palliation of the culpability attending the substitution of one medicine for another.

The Chemist who is coolly indifferent as to whether or not he sells a genuine or an adulterated article, will, with equal levity of feeling, be careless whether the impure medicine be one that is potent in its effects, or one that is capable of producing little or no appreciable influence on the living organism.

The process of qualitative analysis which I pursued for detecting the presence of the oxides of copper, lead, and iron, has nothing of novelty in it, and therefore need not be described. I may, however, remark that from several experiments which I made, I have reason to think that the carbonate of silver contains

a small quantity of water, it may be from not having been properly dried after being washed, or from its being combined with it constitutionally as a *hydrate*.

This additional impurity, together with those already referred to, make the difference between the oxide and carbonate greater than it really appears to be from a mere comparison of their respective equivalent weights.—*Pharm. Jour.*, May 1, 1853.

Prince Street, Kilmarnock, March 22, 1853.

NOTICE OF A NATIVE CARBONATE OF SODA FOUND IN THE TERRITORY OF THE NIZAM, INDIA.

By W. H. Bradley, Esq.
Surgeon in His Highness the Nizam's Service.
(Communicated by Mr. H. Deane.)

The salt in question is found at the Loonar Lake, which is situated in about 20° N. lat. and 77° long. There can be no doubt whatever, that the lake is an ancient volcano, long ago burnt out; and I have fancied that from this vent have streamed the peculiar trachytic rocks to be traced east and west for 100 miles, but this is purely conjecture.

It is placed just within the borders (south-east) of the Great Trap formation of Central India, is cup-shaped, the edge well-defined and continuous, being nearly five miles in circumference, with a depth averaging 500 feet, sloping at a great angle. The outer edge of the crater is flush with the surrounding country on the east and south-east side, and banked on the north, south, and west. The rocks are observed to be disposed in a stratiform manner, the result of the successive pourings forth of the molten matter, and of subsequent upheavals. The point of exit for the boiling lava was evidently at the north-east angle.

Some have imagined the hollow to have resulted from a subsidence of the crust of the earth, but such is not the case. I found decided proofs of its once volcanic energies in a hill covered with scoriæ, close upon the southern side. Besides, were it a case of subsidence, the dip of the stratiform masses of rock would indicate it, which they do not, being all in the usual direction of these trap rocks, dipping away slightly to the north-east.

The hollow is not completely filled with water, only about one-third of its surface being so occupied. A belt of palm trees (*Borassus flabelliformis*) surrounds the margin of the lake, and beyond them is a thick jungle of forest-trees and creepers of vigorous growth. The water of the lake is intensely bitter, is green in color, and contains neither fish or other instances of animal life. To leeward a very strong odor of sulphuretted hydrogen is perceptible, more so at some times than others. The water varies in depth over the lake, the deepest part being towards the west, where it is as much as twenty feet; but this depends entirely on the moonsoon, as a stream from the hill side falls into the lake, which is thus influenced by the rains.

The saline spring is in the centre of the hollow, and although, in dry seasons the crater is nearly free from water, there is always a puddle around this spring. The deposit of salt is found in layers under the mud, being the richest immediatley around the spring. It can only be procured when the water in the lake is low, a circumstance that has not occurred for the last few years.

The natives collect it and store it up in heaps by the side of the lake, with only a thatching of palm leaves to protect it from the weather. It is used in making country soap, glass bangles, and for washing silk.

Although the lake itself is brackish, and strongly saturated with saline matter, still springs of fresh water flow close to its margin; but a little consideration shows that there is nothing astonishing in this circumstance, although, at first, it appears so to visitors. The fresh water, after percolating through the hills, finds vent here, whilst the saline spring rises from the bowels of the earth.

The vegetation of the spot consists principally of Tamarindus, Bauhinia, Conocarpus, Flacourtia, Grewia, Combretia, &c. Upon the sides of the crater are Boswellia, Sterculia, Bombax, Dalbergia, Clematis, &c. Great numbers of wild fowl resort here, but it cannot be a feeding place for them. Green pigeons, orioles, peacocks, monkeys, and hares, abound in the belt of jungle, with animals of less quiet behaviour, for I frequentlty saw the foot-prints of panthers in the sandy soil; and a gallant colonel, some few years ago, had a narrow escape with his life at this place, being severely injured by a tiger.

I could not approach the site of the spring to ascertain what the temperature of it might be—probably it is high. There are hot springs, some forty or sixty miles off, on the east, with a temperature of 120°, where the secondary overlying Trap meets with gneiss and granite.*—*Pharm. Jour.*, May 1, 1853.

Aurungabad, January 27, 1853.

ON THE RESIN OF JALAP.

By W. Mayer.

The rhizomes of *Convolvulus Schiedeanus*, Zucc., known as jalap-roots, contain an active principle, a resin which has been repeatedly made the subject of chemical investigation by Cadet de Gassicourt, Tromsdorff, Gobel, Buchner, Herberger, Kayser and Sandrock. Johnston examined the resin from the rhizome of *Convolvulus orizabensis*, Pell. Buchner and Herberger believed they had detected a basic substance, jalapine, and a resinous acid. Kayser† extracted the resin with ether, and found that the insoluble residue had the complicated formula $C^{42}\,H^{35}\,O^{20}$, was identical with jalapine, and by treatment with bases was converted into an acid soluble in water, composed of $C^{42}\,H^{35}\,O^{20}+HO$. He found, moreover, that both this acid, which he called *hydrorhodeoretine*, and the original resin, rhodeoretine, were broken up, by treatment with hydrochloric acid, into sugar and a neutral substance unacted upon by either concentrated potash or concentrated sulphuric acid. He called this body *rhodeoretinole*. Sandrock obtained results essentially different from those of Kayser. He considered the part insoluble in ether to consist of two resins, one of which was precipitated by acetate of lead from the alcholic solution, the other not. He described both resins as being converted by boiling with alkalies into soluble acids, of which one, ipomic acid, was precipitated by basic acetate of lead from the neutral potash salt; the other, jalapic acid, not.

The resin extracted from the rhizomes of *C. Schiedeanus* by

* Mr. R. Reynolds has determined this salt to be compound of Soda, 32.8, Carbonic acid, 34.2, water, 31, Chloride of Sodium, 2, Alumina, a trace, and hence it is a sesquicarbonate.—See Pharm. Jour., p. 517, vol. xii.

† Chem. Gaz., vol. iii. p. 15.

alcohol, and partly decolorized by treatment with water and animal charcoal, is but partly soluble in ether; and it is the insoluble part which Mayer has examined.

Rhodeoretine.—The rhizomes were treated with boiling water until no more coloring matter was extracted. They were then dried, coarsely powdered, and digested three times with twice their weight of alcohol (0·833 sp. gr.) The alcoholic extract was mixed with water until it began to become turbid, and treated twice with bone-charcoal. The alcohol was then distilled off from the pale yellowish filtrate; a yellow brittle resin remained, which was powdered, digested with ether four or five times, dissolved three times in the least possible quantity of absolute alcohol, and precipitated by ether in order to effect the perfect separation of a minute quantity of the resin soluble in ether. Owing to the neglect of this purification, Kayser estimated the per-centage of carbon nearly 1.5 per cent. too high. Thus prepared, and dried at 212° F., rhodeoretine resembles in appearance the finest gum-arabic; it is odorless, tasteless, brittle, colorless, and transparent in thin pieces, perfectly white when powdered. When it contains but a small amount of water, it becomes soft below 212° F., and may be drawn out into fine threads having a pearly lustre. It softens at 265°.8 F. melts at 302° F. to a yellowish liquid; above 311° F. it begins to decompose. Its alcoholic solution has a feeble acid reaction. It appears to be the active principle of jalap;* 3 or 4 grs. caused repeated and violent purging. It burns with difficulty, and its analysis could only be effected by means of a mixture of 9 parts of chromate of lead and 1 part bichromate of potash, the front part of the tube being charged with chromate of lead alone. Analysis gave—

Carbon	55·01	54·56	54·53	54·57	72	54·75
Hydrogen	7·89	8·07	7·89	7·89	60	7·73
Oxygen	37·10	37·37	37·58	37·54	37	37·52

On the analysis of rhodeoretine, which had not been precipitated by ether, 56·76 carbon and 8·16 hydrogen were obtained. Kayser obtained—

Carbon	56·06	55·87	42	56·37
Hydrogen	7·94	7·89	35	7·84
Oxygen	36·00	36·24	20	35·79

* Schlossberger is not of this opinion. See his Organ. Chemie, 2nd edition, p. 280.

The resin, melted at 302° F., lost 1 equiv. of water, and gave—

Carbon - -	54·86	55·21	72	55·38
Hydrogen - -	8·04	8·00	60	7·69
Oxygen - -	37·10	36·79	36	36·93

Mayer states that he would not have ventured to assign to this body so high an atomic weight except on account of the combinations of the modification soluble in water and its products of decomposition.

Rhodeoretine is but slightly soluble in water, very soluble in alcohol, insoluble in ether. The alcoholic solution is precipitated both by water and alcohol. It is soluble in potash, soda, ammonia and baryta water, more quickly when warm. Acids do not again precipitate it from these solutions; it has become soluble in water. It is little soluble in cold solutions of carbonate of soda or potash, more so when boiled. It dissolves readily in acetic acid, very slowly in cold dilute nitric acid, more quickly and with decomposition when heat is applied; concentrated nitric acid acts upon it energetically, with considerable evolution of nitrous oxide and elevation of temperature. Concentrated sulphuric acid dissolves the resin, and communicates a beautiful red color, which changes to brown in a few hours. If the solution is diluted with water while red, a brownish oleaginous body, of agreeable odor, resembling fresh plums, separates, and the liquid contains sugar. Heated on platinum foil, the resin melts, turns brown, and burns with a bright smoky flame, disengaging a peculiar empyreumatic odor, resembling caramel. A coal remains.

Rhodeoretinic Acid.—This is the body formed by the action of strong bases upon the above resin. The change consists in the assimilation of 3 equivs. of water. It was prepared by introducing 100 grms. of pure rhodeoretine into 1 lb. of baryta-water, and stirring the mixture while heating till it boiled. The resin dissolved quickly and entirely. The baryta was separated from the cold solution by sulphuric acid in very slight excess, which was removed by means of carbonate of lead. The colorless filtrate, evaporated to dryness in a water-bath, left a substance exactly resembling rhodeoretine, except that it is very hygroscopic. Above 212° F. it softens, and melts between 212° and 248° F. Above 248° F. decomposition commences. It has no smell; the aqueous solution has a smell very much like quinces and a strong acid re-

action. It and its salts were all burnt in the same manner as the rhodeoretine :—

Carbon - - -	52·44	52·61	52·48	52·89	72	52·94
Hydrogen - - -	7·93	8·04	7·87	7·82	64	7·84
Oxygen - - -	39·63	39·35	39·65	39·29	40	39·22

Rhodeoretinic acid is insoluble in ether, soluble in all proportions in alcohol and water. The aqueous solutions of the acid or the neutral ammonia salt are not precipitated by any neutral metallic salt; basic acetate of lead gives a very voluminous, flocculent, white precipitate. The acid expels carbonic acid from alkaline and earthy carbonates, as well as from carbonate of lead, especially by boiling. It behaves towards acetic, nitric, and concentrated sulphuric acid precisely as rhodeoretine does.—*London Chem. Gaz.*, Jan. 15, 1853.

ON THE MANUFACTURE OF GLYCERIN.

By Campbell Morfit, M. D.

Glycerin is generally made, on the large scale, either by directly saponifying oil with oxide of lead; or from "the waste," or spent leys of the soap makers. The first mode of obtaining it is complex and expensive, while in the latter, the difficulty of wholly separating the saline matters of the "waste," renders it impossible to obtain a perfectly pure product. In view of these obstacles, and the increasing demand for the article, both in medicine and perfumery, I submit a new process, which has been found, by actual practice, to combine the great and desirable advantages of economy of time, labor and money.

Take one hundred pounds of oil; tallow, lard or "stearin," (pressed lard,) place it in a clean iron bound barrel, and melt it by the direct application of a current of steam. While still fluid and hot, add 15 pounds of lime, previously slaked and made into a milk with 2½ gallons of water, then cover the vessel and continue the steaming for several hours, or until the completion of the saponification. This is known when a sample of the resulting and cooled soap gives a smooth and lustrous surface on being scraped with the finger nail, and breaks with a cracking noise. By this treatment, the fat is decomposed, its acids unite

with the lime to form insoluble lime soap, while the eliminated glycerin remains in solution in the water along with the excess of lime. After it has been sufficiently boiled, it is allowed to cool and settle, and is then to be strained through a crash cloth.

The soap is reserved for sale to stearic candle makers, or else may be reconverted into saleable fat by the process given at pp. 432—445 Morfit's "*Applied Chemistry.*"

The strained liquid contains only the glycerin and excess of lime. It must be carefully concentrated by steam heat. During evaporation, a portion of the lime is deposited on account of its lesser solubility in hot than in cold water. The remainder is removed by treating the evaporated liquid with a current of carbonic acid gas, boiling by steam heat, to convert any soluble *bi*-carbonate of lime that may have been formed, into insoluble neutral carbonate, allowing repose, decanting or straining off the clear supernatant liquid from the precipitated carbonate of lime, and further evaporating, as before, if necessary, to drive off any excess of water.

As nothing fixed or injurious is employed in the process, the glycerin thus prepared, will be absolutely pure.

BALTIMORE, Md., March, 1853. *Silliman's Journal.*

SULPHATE OF QUINIDINE.

There has been recently distributed among commercial men a circular without date or signature and with no indication of its origin, announcing a large adulteration of the sulphate of quinine by a product little known, the *sulphate of quinidine.* It has excited much interest among dealers in quinine, and many methods have been suggested for detecting the presence of quinidine in sulphate of quinine.

This new organic base has been studied successively by MM. Henry and Delondre, Winckler, Howard, Zimmer, and Leers. MM. Henry and Delondre, its discoverers, considered it a hydrate of quinine. MM. Winckler and Leers examined a product made by M. Zimmer, of Frankfort, and did not derive their quinidine from the incriminated quinquinas; moreover, they give no processes for obtaining the substance. M. Howard has

announced that the base is abundantly contained in the *Quinquina cordifolia* of New Grenada, Bolivia and Peru.

These chemists are not agreed in the composition and properties of the quinidine, and no one of them states the proportions between the quinine and quinidine contained in the suspected barks.

The most striking characteristics of the quinidine appear to be its constant crystallization, its very slight solubility in ether, the greater solubility of its sulphate in water, compared with that of the sulphate of quinine.

MM. Bouquet and Schäuffelé have examined a New Grenada Quinquina imported largely into Europe; it comes from near Fusagasuya, and is known under the name of *Quinquina caqueta*. Twelve kilogrammes of bark have afforded as pure quinine as that extracted from the *Q. calysaya;* the sulphate has all the characters of the sulphate of quinine, and shows no trace of quinidine.

In the black bittern which affords ordinarily the quinidine, MM. Bouquet and Schäuffelé have found some grammes of crystallized products, resembling quinidine in some of their characters, but too different to be confounded with it. The total quantity of this crystallized product corresponded to 3 p. c. by weight of the sulphate of quinine obtained, in the treatment of the Quinquina essayed. It is easily understood that the works of a large manufacturer might produce these crystallized matters in small specimens, but not for adulterating the sulphate of quinine.

These authors conclude that the properties of the quinidine are so uncertain that it is prudent to wait for more investigation before admitting it among ascertained chemical bases.—*American Journal of Science and Arts, March*, 1853.

ON THE COMBINATION OF GLYCERINE WITH ACIDS.

By M. Berthelot.

According to the researches of M. Chevreul on the fatty bodies, most of the substances examined by him were capable of being resolved by saponification into fatty acids and glycerine, with fixation of the elements of water. The analogy established by this fact

between fatty substances and ethers was first pointed out by M. Chevruel.

M. Pelouze has attempted the inverse operation, that of reuniting glycerine with the acids, in the same manner as alcohol is combined with these substances. He has succeeded, on the one hand, in obtaining by direct union sulphoglycerates and phosphoglycerates analogous to the sulphovinates*; on the other†, in combining glycerine with butyric acid, the most readily etherizable of all the acids.

Butyrine, the only neutral fatty substance which has hitherto been reproduced, is obtained by indirect etherification, by causing either sulphuric or hydrochloric acid to act upon a mixture of glycerine and butyric acid.

I have succeeded in combining glycerine with other acids, namely, the acetic, valerianic, benzoic and sebacic acids, and others. The process which furnished these compounds is, with some modifications, that which is employed to etherize the fatty acids, and which furnished butyrine to MM. Pelouze and Gélis. I mix the dry acid with syrupy glycerine, heat the mixture to 212° F., pass through it a current of hydrochloric acid gas during several hours, keeping the mixture at that temperature, and then allow it to cool in the current of gas. I then leave the whole at the ordinary temperature for several hours, days, or even weeks, if necessary repeating the action of the hydrochloric acid. After the lapse of a longer or shorter time, the compound is produced; to isolate it, it is only necessary to saturate the mixture with carbonate of soda. It is purified by repeated washings and the usual processes.

The above-mentioned compounds are oleaginous, and scarcely, if at all, soluble in water. They are neutral substances, incapable of uniting immediately with the alkaline carbonates. Alkalies attack them slowly, saponifying them; in this way they all regenerate the acid from which they are derived, the glycerine being isolated. They may also be decomposed in an analogous manner by saturating their alcoholic solutions with muriatic acid, a process employed by Rochleder for the extrication of the glycerine from castor oil. In this manner, after a repose of twenty-four hours, glycerine and the ether of the acid employed are obtained. All

* Berzelius subsequently prepared the tartroglycerates.

† Mémoire sur l'acide butyrique, par MM. Pelouze et Gelis.—*Ann de Chim. et de Phys.*, 3rd series, x.

that is necessary to separate the glycerine is the precipitation of the ether produced by water (except in the case of acetic ether) and the evaporation of the aqueous fluid. It still contains a little free acid, to get rid of which it is agitated with a little oxide of silver, and filtered after the addition of water. The concentrated fluid furnishes pure glycerine, presenting all its characters. I have reproduced it in this manner with each of the combinations formed with benzoic, valerianic, acetic and sebacic acids.

The acetic compound (*acetine*) is very distinctly soluble in water; it possesses an agreeable odor, similar to that of acetic ether, but much more permanent. Submitted to a carefully-conducted fractional distillation, it may be volatilized without sensible decomposition. After this operation, it preserves its pleasant odor, and presents the appearance of a limpid and colorless oil, possessing a taste which at first is saccharine like that of glycerine, afterwards acrid and ethereal. Treated with muriatic acid gas and alcohol, it is reduced, as before distillation, into acetic ether and glycerine. The mixture of acetic acid and glycerine, saturated at 212° F. with muriatic acid gas, only begins to furnish this substance after a week's repose. Several natural oils, examined by M. Chevreul and others, and especially cod-liver oil, yield acetic acid on saponification; it is possible that acetine may form one of the principles of these oils.

The valerianic compound (*valerine*) is more readily obtained; it possesses a peculiar, but faint, semi-ethereal, semi-valerianic odor. These are properties possessed by the *phocenine* of M. Chevreul, one of the principles of the oils of the dolphin, which is separable into phocenic or valeric acid and glycerine. The quantity of phocenine in these oils may amount to a fourth or a third of their weight.

The benzoic compound (*benzoïcine*) is formed in a few hours. It is more viscous than the two preceding. Its taste is aromatic and somewhat like pepper.

The sebacic compound (*sebine*) is formed in large quantity in twenty-four hours. It is an example of a neutral compound of a bibasic acid and glycerine.

The existence of these substances adds support to the facts already known, in showing that neutral fatty bodies really consist of fatty acids and glycerine.

The preceding compounds are not the only ones furnished by glycerine. I have already obtained several others, and hope to succeed in reproducing margarine and stearine, the most important of the glycerine compounds, and the principal constituents of the natural fatty substances.—*Lond. Chem. Gaz.*, April 1, 1853, from *Comptes Rendus*, Jan. 3, 1853.

ANHYDROUS VALERIANIC ACID.

Chiozza has obtained anhydrous valerianic acid by the method which Gerhardt has applied to the isolation of acetic and butyric acids. When oxychlorid of phosphorous, $P\,Cl_3\,O_2$, is brought into contact with valerianate of potash, a violent reaction takes place and the odor of the oxychlorid disappears. By treating the mass with a weak solution of carbonate of potash, and then with ether, and evaporating the ethereal solution, the anhydrous acid is obtained as a limpid, highly mobile liquid, lighter than water, and possessing a feeble odor of apples. The liquid boils at 215°, and distills over perfectly colorless: its vapor irritates the eyes and provokes coughing. The reaction by which the anhydrous valerianic acid is obtained, is represented by the equations,

$$P\,Cl_3O_2+3(C_{10}H_9O_3,\,KO)=PO_5\,3KO+3(C_{10}\,H_9O_2Cl)$$
$$3(C_{10}\,H_9O_3,\,KO)+3(C_{10}\,H_9O_2Cl)=3KCl+3(C_{10}\,H_9O_3)$$

the oxychlorid of valeryl, $C_{10}\,H_9O_2Cl$, is here first set free and then reacts on another portion of valerianate of potash.

By the action of oxychlorid of benzoyl on valerianate of potash the author has also obtained a compound of anhydrous valerianic with anhydrous benzoic acid represented by $C_{10}\,H_9O_3+C_{14}\,H_5O_3$. It is an oily liquid, heavier than water, and leaving an odor like that of anhydrous valerianic acid. By distillation it is separated into anhydrous benzoic and anhydrous valerianic acids. Alkaline solutions transform it into valerianates and benzoates.

By the action of aniline upon anhydrous valerianic acid Chiozza has prepared valeranilide crystallizing in magnificent rectangular tables fusing at 115° C. Its formula is $N\,C_{12}\,H_6,\,C_{10}H_9O_2$.—*American Journal of Science and Arts, March*, 1853, from *Compt. Rend.*, xxxv. 568.

Varieties.

The general features and ancient Mammalia of the Mauvaises Terres of Nebraska. [Being part of the Report of D. D. Owen, Esq., U. S. Geologist.] —After leaving the locality on Sage Creek, [a southern branch of the Cheyenne,] affording the above-mentioned fossils, [fossil ammonites, &c. of the Eocene tertiary,] crossing that stream, and proceeding in the direction of White river, about twelve or fifteen miles, the formation of the Mauvaises Terres proper bursts into view, disclosing, as here depicted, one of the most extraordinary and picturesque sights than can be found in the whole Missouri country.

From the high prairies, that rise in the background, by a series of terraces or benches, toward the spurs of the Rocky Mountains, the traveller looks down into an extensive valley, that may be said to constitute a world of its own, and which appears to have been formed, partly by an extensive vertical fault, partly by the long continued influence of the scooping action of denudation.

The width of this valley may be about thirty miles, and its whole length about ninety, as it stretches away westwardly, towards the base of the gloomy and dark range of mountains known as the Black Hills. Its most depressed portion, three hundred feet below the general level of the surrounding country, is clothed with scanty grasses, and covered by a soil similar to that of the higher ground.

To the surrounding country, however, the Mauvaises Terres present the most striking contrast. From the uniform, monotonous, open prairie, the traveller suddenly descends one or two hundred feet, into a valley that looks as if it had sunk away from the surrounding world; leaving standing, all over it, thousands of abrupt, irregular, prismatic, and columnar masses, frequently capped with irregular pyramids, and stretching up to a height of from one to two hundred feet, or more.

So thickly are these natural towers studded over the surface of this extraordinary region, that the traveller threads his way through deep, confined, labyrinthine passages, not unlike the narrow, irregular streets and lanes of some quaint old town of the European continent. Viewed in the distance, indeed, these rocky piles, in their endless succession, assume the appearance of massive artificial structures, decked out with all the accessories of buttress and turret, arched doorway and clustered shaft, pinnacle, and finial, and tapering spire. One might almost imagine oneself approaching some magnificent city of the dead, where the labor and the genius of forgotten nations had left behind them a multitude of monuments of art and skill.

On descending from the heights, however, and proceeding to thread this vast labyrinth, and inspect, in detail, its deep, intricate recesses, the realities of the scene soon dissipate the delusions of the distance. The castel

lated forms which fancy had conjured up have vanished; and around, on every side, is bleak and barren desolation.

Then, too, if the exploration be made in midsummer, the scorching rays of the sun, pouring down in the hundred defiles that conduct the wayfarer through this pathless waste, are reflected back from the white or ash-colored walls that rise around, unmitigated by a breath of air, or the shelter of a solitary shrub.

The drooping spirits of the scorched explorer are not permitted, however, to flag. The fossil treasures of the way, well repay its sultriness and fatigue. At every step, objects of the highest interest present themselves. Embedded in the debris, lie strewn, in the greatest profusion, organic relics of extinct animals. All speak of a vast fresh-water deposit of the early Tertiary Period, and disclose the former existence of most remarkable races, that roamed about in bygone ages high up in the Valley of the Missouri, towards the sources of its western tributaries; where now pastures the big-horned *Ovis montana*, the shaggy buffalo or American bison, and the elegant and slenderly constructed antelope.

Every specimen as yet brought from the Bad Lands, proves to be of species that became extirminated before the mammoth and mastodon lived, and which differ in their specific character, not alone from all living animals, but also from all fossils obtained even from cotemporaneous geological formations elsewhere.

Along with a single existing genus, the Rhinoceros, many new genera never before known to science have been discovered, and some, to us at this day, anomalous families, which combine in their anatomy, structures now found only in different orders. They form, indeed, connecting links between the pachyderms, plantigrades and digitigrades. For example, in one of the specimens from this strange locality, described by Dr. Leidy under the name of *Archæotherium*, we find united characters belonging now to the above three orders; for the molar teeth are constructed after the model of those of the hog, peccary and babyroussa; the canines as in the bear; while the upper part of the scull, the cheek bones, and the temporal fossa assume the form and dimensions which belong to the cat tribe. Another, the *Oreodon* of Leidy, has grinding teeth like the elk and deer, with canines resembling the omnivorous thick-skinned animals; being, in fact, a race which lived both on flesh and vegetables, and yet chewed the cud like our cloven-footed grazers.

Associated with these extinct races, we beheld also, in the Mauvaises Terres, abundant remains of fossil pachydermata, of gigantic dimensions, and allied in their anatomy to that singular family of proboscidean animals, of which the tapir may be taken as a living type. These form a connecting link between the tapir and the rhinoceros; while, in the structure of their grinders, they are intermediate between the daman and rhinoceros; by their canines and incisors, they connect the tapir with the horse, on the one hand, and with the peccary and hog on the other. They belong to the same

genus of which the labors of the great Cuvier first disclosed the history, under the name of *Palæotherium*, in publishing his description of the fossil bones exhumed from the gypsum quarries of Montmartre, near Paris, but are distinct in species; and one, at least, of this genus, discovered in the Bad Lands (*Palæotherium Proutii,*) must have attained a much larger size than any which the Paris basin afforded. In a green, argillo-calcareous, indurated stratum, situated within ten feet of the base of the section, a jaw of this species was found, measuring, as it lay in its matrix, five feet along the range of the teeth, but in such a friable condition, that only a portion of it could be dislodged; and this, notwithstanding all the precautions used in packing and transportation, fell to pieces before reaching Indiana.—*American Journ. of Science and Arts.*, March, 1853.

Fusion and volatilization of Platinum and Silica.—BERZELIUS in his Traité de Chemie (German edition) reports that he had seen a mass of semifused platinum which M. Sefström had obtained by heating in an ordinary furnace filings of platinum mixed with charcoal placed in a crucible. This fact, which had been overlooked, has been carefully studied and submitted to examination on a large scale by M. Deville, so that now the fusion of platinum in a coal fire is no more a difficulty, neither the volatilization of this metal.

In order to verify a fact in analytical chemistry concerning the silicates, M. Henri St. Claire Deville put a platinum crucible, closed with its cover, in a Hessian crucible, and placed it in a small laboratory furnace. The combustible consisted accidentally of furnace cinders ("escarbilles") and the whole was subjected to the action of the bellows of a forge. On returning after some time to examine the state of the silicate, he saw with surprise that the platinum crucible, as well as the Hessian, was reduced to a paste, perfectly fused.

On reporting the facts to the Academy, M. Deville presented a platinum crucible, which he had caused to melt in lime; he had also a cover of platinum, and also a specimen of pure silver fused in graphite.

As sandstone is perfectly fusible at these temperatures, M. Deville substitutes for it some compact lime containing a little silica, which he had carved into a crucible; the air reached the furnace through a plate of iron pierced with holes arranged circularly to a distance of 5 centimeters around the center.

I have seen the apparatus, and observed the simple and easy method of using it; the humble appearance of this small furnace stands out the more remarkably in the magnificent laboratory of the Ecole Normale, where M. Deville carries on his labors. This chemist has also succeeded in volatilizing silica, which had already been previously done by M. Gaubin, with a gas blowpipe of his invention, fed by oxygen.

It is essential for success that the combustible should be of the proper kind, and finely divided. The best is made of the residue of the combus-

tion of coal, mixed with cinders such as escape from the grate of a furnace, and are called "escarbilles." Coke and charcoal have produced nothing satisfactory.

M. Deville informs me that he has found no difference between the fused and welded platinum. We add, however, that he has not compared the electro-chemical properties of these metals, nor the action on light.—*Silliman's Journal*, May, 1853.

On the Use of Fatty Acids as a Source of Light. By J. Cambacérès. The author has endeavored to reduce the cost of fabrication of these fatty acids by employing such materials as will furnish a by-product more valuable than the sulphate of lime obtained by the saponification with lime. He has succeeded in preparing in this way sulphate of alumina, a substance largely used in dyeing.

For this purpose, he first saponifies the fat with potash or soda lye. The soap, containing an excess of alkali, acts upon clay so as to dissolve the alumina, which combines with the fatty acids, forming a soap which is insoluble in the alkaline liquid, and the alkali is again set free. The alumina-soap may be separated as a gelatinous precipitate by an excess of alkali, by a large quantity of water, or by saline solutions. The gelatinous character of the alumina soap facilitates its decomposition by acids, and the alumina salt may be obtained by evaporation, during which the silica likewise taken up by the alkali is separated.

The decomposition of soap by alumina is undoubtedly owing to the affinity of alumina for fat acids and the insolubility of the alumina soap in alkaline lye.

In order to prepare the fat acids in this way at the least possible cost, care must be taken that in washing the soap as little alkali as possible be left. However, a residue of alkali is not objectionable on any other grounds, for when the soap is decomposed with sulphuric acid, it forms alum. It follows, therefore, from these facts, that in places where clay free from iron can be procured, the fabrication of acetate and sulphate of alumina may very advantageously be combined with that of stearic acid, because, according to the author, the relative cost of production, notwithstanding the high price of alkalies, is less than when lime is employed in the saponification.—*Chem. Gaz., May* 2, 1853, from *Comptes Rendus*, vol. lvii. p. 144.

Manufacture of Paper.—It is well known that paper which is very white when first made, often becomes yellow some time after being used. The yellow color is not always uniform, but often comes out in spots more or less large of a circular outline, and a rusty tint. In some Paris manufactories, this defect (which is incorrectly attributed to an alteration of the fibre) is remedied in a simple manner, and as the process of discoloration may not be commonly used in America, judging from some paper I have seen, I make a brief mention of the subject.

These researches were made here by a manufacturer who combines in a high degree science and technology. M. Gélis recognized at first that the change of color was not due to any alteration in the ligneous fibre, and was owing to iron. But what the source of the iron? and how is it introduced? An examination of the manufacture, through its processes, shows that there is less iron in the pulp than in the paper made from it. The origin of the iron is hence not in the preparation of the pulp, but it must be attributed to the drying cylinders of steel under which it is passed while yet moist. The chlorine contained in the paste, and which it is very difficult wholly to remove by the washish process, becomes suddenly vaporized under the heated cylinders, attacks these cylinders, and forms the protochlorid (Fe Cl) which thence impregnates the paper. Colorless itself, this chlorid gradually absorbs oxygen on exposure to the air, and thus the coloration takes place.

It is therefore not a remedy against iron but against chlorine that is required. The hyposulphite of soda is the simple antidote, and a very small quantity suffices to eliminate a large quantity of chlorine, since one equivalent of hyposulphurous acid requires four equivalents of chlorine, to transform it into sulphuric acid.

For testing the complete removal of the chlorine, M. Gélis uses a liquor made of iodide of potassium and amidon (starch.) This liquor becomes instantly blue if there is the least trace of chlorine.—*Silliman's Journal.*

A Formula for a Castor Oil Electuary. By Septimus Piesse.—Many persons' stomachs revolt at taking castor oil in an undisguised form. To overcome this repugnance, it has been the practice to administer it in the shape of an emulsion, which involves a large increase in the bulk of the dose to be taken, as well as the employment of a considerable quantity of gum or the yolk of an egg, to form the emulsion. To disguise the castor oil, to give it in a condensed form, and to diminish, as much as possible, the quantity of the excipient, the following formula has been devised:

Take of Castor oil, ...	3 ounces.
White soft soap, ...	1 drachm.
Simple syrup, ...	1 drachm.
Oil of cinnamon, ...	6 drops.

Rub the soap with the simple syrup in a mortar, and then add gradually the castor oil, with constant trituration, until it is thoroughly incorporated with the above ingredients. Finally, mix with the electuary thus formed, the oil of cinnamon, or any other essential oil that may be preferred. By these means, a gelatinous electuary will be formed, which is rather palatable than otherwise, and nearly equals, bulk for bulk, castor oil in strength. The quantity of potash present in a dose of this electuary is only a homœopathic dose, and, consequently, not likely to produce a bad result in any case, even when its use should be contra-indicated.—*Annals of Phar.*

Salt of Western Pennsylvania. By JAMES C. BOOTH and T. H. GARRETT. —The value of common salt for dairy purposes, preserving food, and for general use, and the singularly advantageous position of the salt springs or wells of Western Pennsylvania, issuing at the mouths of coal mines, led us to investigate the relative purity of some of the salt manufactured there, in comparison with foreign salt imported and largely employed on the coast. We subjected to analysis, Turk's Island, Liverpool ground Rock, and two samples of salt, coarse and fine, kindly furnished us by Mr. Lewis Peterson, of Salina Farm, near Tarentum, Pennsylvania, where and by whom the two samples were manufactured.

The following tabular arrangement of the result of analysis gives a clearer comparative view of their relative purity and value:

	Chloride of Sodium.	Chloride of Magnes.	Chloride of Calcium.	Sulphate of Magnes.	Sulphate of Lime.
Coarse, Tarentum, Penn.,	97.89	1.00	1.11	none.	trace.
Fine, " "	98.87	0.51	0.62	none.	trace.
Liverpool ground Rock,	98.55	0.08	none.	0.16	1.21
Turk's Island, . .	93.85	3.47	none.	none.	2.68

Beside these, the Turk's Island contains a little sand, of which the others only contain traces. The difference between them is evidently that the impurities in the Pennsylvania salt are chlorides, and in the others, sulphates of lime and magnesia. Since the chlorides are easily removed by washing, it is evident that the Pennsylvania salt might be brought to a state of absolute purity, if it were desirable or necessary. The salt manufactured by Mr. Lewis Peterson, bears a close comparison with the Liverpool ground Rock, and his fine variety surpasses it. Both of his varieties are 4 or 5 per cent. purer than Turk's Island salt.—*Journal of the Franklin Institute of Pennsylvania.*

Cachou Aromatisé.—Take of extract of liquorice and water, of each 3½ oz.; dissolve by the heat of a water-bath, and add Bengal catechu, in powder, 462 grs.; gum arabic, in powder, 231 grs.; evaporate to the consistence of an extract, and then incorporate the following substances, previously reduced to fine powder:—Mastic, cascarilla, charcoal, and orris root, of each 30 grs.; reduce the mass to a proper consistence, remove it from the fire, and then add English oil of peppermint 30 drops, tincture of ambergris and tincture of musk, of each 5 drops; pour it on an oiled slab, and spread it out, by means of a roller, to the thickness of a sixpenny piece; after it has cooled, apply some folds of blotting paper to absorb any adhering oil, moisten the surface with water, and then cover it with the sheets of silver leaf. It must now be allowed to dry, then cut into very thin strips, and these again divided into small pieces, about the size of a fenugreek seed.—*Pharm. Journ., from Journal de Pharmacie.*

Juniper Tar Soap.—This soap is made by distillation from the tar of the wood of the *Juniperis communis*, by dissolving this spirit in a fixed vegetable oil, as that obtained by expression from almonds or olives, and forming a soap by means of a weak soda-lye, after the customary manner. This yields a moderately firm and clear soap, which may be readily used by application to parts affected with eruptions at night, mixed with a little water, and carefully washed off the following morning. This soap has lately been much used for eruptive disorders, particularly on the Continent, and with various degrees of success. It is thought that the efficient element in its composition is rather less impure hydrocarburet than that known in Paris under the name *huile de cade*. On account of its ready miscibility with water, it possesses great advantage over the common tar ointment.—*Annals of Pharmacy.*

Chemical examination of Naples Soap.—A. Faiszt has submitted this celebrated shaving soap to analysis. He states that it is made by saponifying mutton fat with lime, and then separating the fatty acids from the soap thus formed, by means of a mineral acid. These fatty acids are afterwards combined with ordinary caustic potash to produce the Naples soap. He found that 100 parts of this soap contained

	Parts.
Fatty acids, ...	57.14
Potash combined with the fatty acids, .	10.39
Sulphate of potash, chloride of potassium, with a trace of carbonate of potash, .	4.22
Silica, &c.	0.46
Water, ...	27.68

Annals of Phar., from Gewerbeblatt aus Württemberg.

A Purple-red Ink for marking Linen.—The place where the linen is to be marked is first wetted with a solution consisting of three drachms of carbonate of soda, and three drachms of gum arabic, dissolved in an ounce and a half of water, then dried and smoothed. The place is now to be written on with a solution composed of one drachm of chloride of platina dissolved in two ounces of distilled water, then allowed to dry. When quite dry, the writing is to be painted over with a goose's feather, moistened with a liquid consisting of one drachm of protochloride of tin dissolved in two ounces of distilled water.—*Annals of Phar., from Böttger's Polyt. Notizblatt.*

Hyposulphite of Soda and Silver.—This compound substance has lately been recommended as a remedial agent, by Dr. J. Delioux, of Cherbourg. It is prepared by pouring upon oxide of silver, recently precipitated by potassa, a solution of hyposulphite of soda, until it is completely dissolved. After evaporation of this mixture, crystals of hyposulphite of soda and silver remain. This compound salt has the appearance of a greyish-white

crystalline powder, having a sweetish-slightly styptic taste; it is readily soluble in water, but almost, if not entirely insoluble in alcohol. After long exposure to light, it becomes of a black color, whereas it preserves its greyish-white crystalline appearance if carefully kept, either in bottles or dark-colored glass, or covered with paper. Its solution also becomes almost black if long exposed to the light, yet not so quickly as the solution of nitrate of silver. If perfectly pure, it does not discolor the skin, or linen, as the nitrate of silver does; nor does it possesss the same power in coagulating albumen as the nitrate does. Dr. J. Delioux has administered this compound salt in many diseases, the results of which trials he has made known to the profession in one of the medical journals of Paris.—*Annals of Pharmacy.*

Photography:—The Fixation of Colors.—M. Niepec de Saint-Victor laid before the Academy of Sciences, at the sitting of the 8th of November, daguerreotypes upon which he had succeeded in fixing, in a manner more or less permanent, colors by the camera-obscura. M. Niepec states, that the production of all the colors is practicable, and he is actively engaged in endeavoring to arrive at a convenient method of preparing the plates. "I have begun," he says, "by reproducing in the dark chamber, colored engravings, then artificial and natural flowers, and lastly dead nature—a doll, dressed in stuffs of different colors, and always with gold or silver lace. I have obtained all the colors; and, what is still more extraordinary and more curious is, that the gold and silver are depicted with their metallic lustre, and that rock-crystal, alabaster, and porcelain, are represented with the lustre which is natural to them. In producing the images of precious stones and of glass we observe a curious peculiarity. We have placed before the lens a deep green, which has given a yellow image instead of a green one; whilst a clear green glass placed by the side of the other is perfectly reproduced in color." The greatest difficulty is that of obtaining many colors at a time; it is, however, possible, and M. Niepec has frequently obtained this result. He has observed, that bright colors are produced much more vividly and much quicker than dark colors:—that is to say, that the nearer the colors approach to white the more easily are they produced, and the more closely they approach to black the greater is the difficulty of reproducing them. Of all others the most difficult to be obtained is the deep green of leaves; the light green leaves are, however, reproduced very easily. After sundry other remarks, of no peculiar moment, M. Niepec de Saint-Victor informs us, that colors are rendered very much more vivid by the action of ammonia, and at the same time this volatile alkali appears to fix the colors with much permanence. These results bring much more near than hitherto the desideratum of producing photographs in their natural colors. The results are produced upon plates of silver which have been acted upon by chloride of copper or some other combination of chlorine. The manipulatory details have not been published, but we understand they are very easy.—*Jour. Frank. Inst. from the London Athenæum.*

Editorial Department.

American Pharmaceutical Association.—As the approaching meeting of the Association will occur before our next issue, we again call attention to the President's notice of invitation, hoping that the attendance will be large. The time fixed on, we are informed, does not suit our Southern and Western brethren, yet we hope some of them will make a sacrifice and attend; after which they can refresh themselves by a few days among the White Mountains, or the Catskills, on their return.

NOTICE.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The annual meeting of the American Pharmaceutical Association will be held at Boston on the 24th of August, 1853. The object of the Association being the advancement of Pharmacy in the United States, it is desirable that a general interest in its favor should be created among the pharmaceutists and druggists. According to the requirement of the Constitution, the following conditions of membership are published, and an invitation is hereby extended to all who are eligible to membership and who feel an interest in the Association, to attend the ensuing meeting.

"Section 2d, *Article 1st.*—All pharmaceutists who shall have attained the age of 21 years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association, are willing to subscribe to them, are eligible for membership.

"*Article 2d.*—The members shall consist of Delegates from regularly constituted Colleges of Pharmacy and Pharmaceutical Societies, who shall present properly authorized credentials, and of other reputable pharmaceutists, feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from places whence they come. If no such delegates are present at the meeting, they may, on obtaining the certificate of any three members of the Association, be admitted, provided they are introduced by the Committee on Credentials."

"*Article 5th.*—Every local Pharmaceutical Association is entitled to send five delegates."

Philadelphia, 4th mo. 11th, 1853. DANIEL B. SMITH, President.

Massachusetts College of Pharmacy and the American Pharmaceutical Association.—We learn through Mr. Joseph Burnet, that at a meeting of the Massachusetts College of Pharmacy, held on the 2d of June, Daniel Henchman, William A. Brewer, Thomas Restieaux, H. W. Lincoln and T. Larkin Turner were elected delegates to attend the meeting of the Association. On the same occasion a committee was appointed to make the necessary preparations for the accommodation of the Association, which we are authorized to say will convene on Wednesday, the 24th of August next, at the rooms of the Massachusetts College of Pharmacy in Phillips' Place, Boston.

Inspection of Drugs.—At page 297 the reader will find an account of the proceedings of the Philadelphia College of Pharmacy in relation to the inspection of drugs. This action appears to have arisen partially from the disposition manifested by the Government to appoint new examiners, as instanced in the displacement of Dr. Stewart of Baltimore, whose qualifications for the office are undoubted, and partially from dissatisfaction with the manner in which the law has been executed at this port. Believing that a new appointment was about to be made, the College, impressed with the importance of having properly qualified officers, felt bound to make known its views to government, and urge the necessity not only of having a well qualified examiner, but that the department should issue new instructions by which there would be less latitude for the occurrence of anomalous decisions. The new circular of instructions will be found at page 301. We refrain from an analysis of it at this time, believing that while the document is certainly an improvement on the past indefinite instructions in some respects, yet it needs amendment in others, and should receive the deliberate attention of the several Colleges, and the American Pharmaceutical Association, especially as Mr. Guthrie has invited criticism. Dr. Bailey deserves credit for his interest in the matter, and we trust he will long continue an executor of the law; yet, while we have great confidence in his own good sense, we hope the last clause of the instructions will not prove in other hands the origin of annoying delays as is likely to be the case where an examiner is disposed to be *crooked* in his course of action. While the law gives the *selection* of the analytical chemist to the collector, and requires of him *a detailed analysis under oath* or affirmation, we cannot but doubt the propriety and justice of again bringing the issue in contact with the examiner when the *law* distinctly says the chemist's report shall be *final*.

Professional Quackery.—The stand which Medical Associations have taken in regard to quackery, has been clear and decided—no quarter is given—no compromise permitted; yet quackery in a modified form is acknowledged and encouraged by many of the very men who are most decided in their condemnation of the more glaring species. An apothecary invents a compound of some well known drug or drugs, sends specimens of it to certain prominent physicians, accompanied by a statement of its superior qualities, and invites them to prescribe it. So far all is well; every apothecary has a perfect right to manifest his enterprise, by anticipating the wants of his medical patrons. But when the physician has tried it and is pleased with its effects, and prescribes it in other neighborhoods, his patients are compelled to go to the original apothecary, who refuses to divulge the secret of its composition and mode of preparation. If the physician asks for it, he is told in such general terms, that he is unable to give the recipe. Now, if physicians are true to their principles, they should refuse to prescribe a preparation, the recipe of which is withheld from them, for there is really little difference between prescribing such preparations and regular quackeries.

STATISTICAL CIRCULARS.—The Committee appointed by the Board o. Trustees of the Philadelphia College of Pharmacy, at the request of the National Pharmaceutical Association, to collect statistical information, has issued the following circular to druggists throughout the Middle, Southern, and Western States, (generally one to each principal city and town,) querying: "1st. How many persons in ——— prepare and sell standard medicines as their principal business, and how many connect the sale of medicines with general merchandizing? 2d. To what extent do your druggists and apothecaries employ the United States Pharmacopœia as their standard authority, and use the officinal weights and measures? 3d. Do Physicians generally send their prescriptions to the apothecaries and druggists of the district named, or do they furnish medicines themselves? 4th. Have the apothecaries and druggists formed any association for mutual advantage, or for educational purposes? 5th. What information have you in relation to the prevalence of quackery, its increase or diminution; the sale of poisons, or on other subjects relating to our business, likely to be interesting?" The Committee have thus far received answers from the following persons and places, viz:—J. M. Allen, Chester, Del. Co., Pa.; Dr. George Martin, Concordville, Pa.; Wm. G. Baker, Lancaster City, Pa.; Wm. Heyser, Chambersberg, Pa.; Dr. J. M. Confer, Fosteria, Blair Co. Pa.; Peter V. Coppuck, Mount Holly, N. J.; R. S. Patterson, Washington, D. C.; Dr. James Cooke, Fredericksburg, Va.; Charles A. Santos, Norfolk, Va.; Dr. R. H. Stabler, Alexandria, Va.; Robert Battey, Rome, Floyd Co., Georgia; Dr. Maxwell, Pensacola, Florida; E. Bernard, Jr., Tallahassee, Florida; P. Caverly Boyer and John H. Tilghman, New Orleans, La.; P. H. McGraw, Natchez, Miss.; Dr. Kemp Alston, Jackson, Miss.; Dr. R. O. Currey, Nashville, Tenn.; G. T. Chamberlain, St. Louis, Mo.; and Wm. A. Graham, Zanesville, Ohio. The Committee tender their thanks through this medium for the attention bestowed. They also hope that any druggist, apothecary or physician who, seeing the above list of questions, feels disposed to communicate information, will do so by addressing the Chairman of the Committee, Edward Parrish, Philadelphia, any time before the 1st of August.

We have received a copy of a Circular of similar import issued by the the Massachusetts College of Pharmacy extensively through that section of country. We trust our brethren of the New York, Baltimore, Richmond and Cincinnati Colleges will claim a share in the work.

THE SMITHSONIAN INSTITUTION.—During a recent visit to Washington we were much gratified by calling on Professor Henry, Secretary of the Smithsonian Institution, who politely explained to us some of the more prominent operations going on under its auspices. The object of its founder, Mr. Smithson, was the diffusion of knowledge amongst men, and whilst stating this, he refrained from pointing out the way it should be effected. There exists a difference of opinion regarding the manner of executing the trust, one portion of the Regents being in favor of making it directly cumulative

as the depository of a great National Museum and Library, whilst others, of which Prof. Henry is the chief, advocate the devotion of the funds to the publication of original memoirs, to the institution of new researches, to the encouragement of all kinds of laudable scientific explorations and investigations, whether done specially for the Institution or indirectly by others; in a word, to make the Institution a great central, science-sustaining, knowledge-spreading power, whose influence shall be felt and appreciated where ever and by whosoever the arts and sciences are cultivated. The fund is deemed too limited to carry out the ideas of those who wish to make it a National Library and Museum; and unless Congress should make donations so liberal as to swallow up the fund of Smithson by their magnitude, rendering its endowment national rather than individual, it could not be enlarged to such an extent as to make it pre-eminently important to men of science, and effect the other offices properly required by the will of its founder.

One of the most useful features of the Institution as now conducted, is its system of literary exchanges with scientific societies and public libraries of Europe, which will do more for the dissemination and circulation of scientific literature than any pre-existing arrangement. The Institution has agents in Europe who distribute to the several societies &c., 1st, its own publications; 2d, the transactions and other publications of American societies, and to some extent the productions of individuals when sent as donations to societies abroad. The same agents receive in return the similar publications of Europe, and forward them to Washington, from whence they are distributed to the scientific bodies here free of all expense, except the carriage from Washington, the duties being remitted by Congress on all publications coming through this medium. Professor Baird, who has charge of the Exchange department, kindly explained to us the details of the system and the manner in which the exchanges are effected. We saw in the book room the packages that were about being forwarded to Europe, those for each country together; their bulk, amounting to many hundred weight, if not tons, gave a forcible illustration of the extent of this branch of the operations. Among other labors the Institution is conducting an extended system of simultaneous meteorological observations, by near 400 observers, in as many locations over the surface of the United States, Canada, Nova Scotia, the West Indies, and on the Pacific Coast. The observations, which are recorded in blanks prepared by the Institution, and distributed to the observers, are made several times in the day at stated intervals, and it is hoped, when a sufficient number of these have accumulated at Washington, that the actual condition of the atmosphere, over the whole country, at several times in the day, and for consecutive weeks and months as thus ascertained, will enable the scientific corps to solve the problem of American storms, and many other phenomena yet but little understood. Already Prof. Henry has commenced a series of meteorological charts drawn on outline maps of the United States, with clear weather, clouds, fog, rain, snow, and hail marked on them by colors, each map re-

presenting the state of the atmosphere at a given hour over the entire extent of our country.

The five volumes of the Memoirs of the Institution are already a noble monument to the memory of Smithson, as imperishable as the existing civilization, and long may they continue to emanate on the mission of diffusing knowledge to mankind.

Tully's Materia Medica.—The fifth number, March, 1853, of this work is acknowledged. It contains a continuation of the "Means of ascertaining the powers of new and previously unknown articles,"—Experiments on the diseased human subject,—experiments on the healthy human subject,—careful observation of the effects of articles taken by mistake,—of what Materia Medica should consist,—what the nomenclature should be.

We hope the patronage of the book will induce Dr. Tully to continue its publication, as, from his long experience as an observer, his pages will doubtless be filled with numerous researches as interesting as original.

Announcement and Catalogue of Edward Parrish's School of Practical Pharmacy *for Medical Students, S. W. corner of 8th and Arch sts.* Philadelphia, 1853.

Apothecaries frequently have cause to complain of the construction of physicians' prescriptions as regards the association of incompatibles, and in giving directions incapable of being followed. It may safely be asserted that the authors of such have not had an opportunity of practising Pharmacy. The School of Practical Pharmacy of Mr. Parrish is intended to meet this want as regards the future, by affording to medical students, during the pursuit of their other studies, opportunities for learning the manipulations of the apothecary's shop. "The art of prescribing medicines, especially with reference to combining them extemporaneously, claims a large share of attention, and brings prominently into view pharmaceutical nomenclature and abbreviation, the grammatical construction of prescriptions, the calculation and apportionment of doses, the judicious use of excipients and adjuvants, and the avoidance of incompatibles." The tuition is by lectures and by practising classes of four students each, one of whom acts as recorder and keeps regular minutes of the operations of his class. In a word, we can cheerfully recommend this useful private institution to the attention of medical students as the source of knowledge rarely to be obtained without service in the shop. The fee for the course of three months, which includes the lectures and practice, is ten dollars.

The Virginia Medical and Surgical Journal. Edited by George A. Otis, M. D., and Howell L. Thomas, M. D., Richmond, Virginia.

This new monthly of 84 pages, dates its origin in April, 1853, and in neatness of execution, variety of matter, and Editorial spirit, ranks with the best periodical literature of the medical press.

The Southern Journal of the Medical and Physical Sciences. Nashville, May, 1853. No. 3.

This Journal contains an elaborate report to the Tennessee Medical Society, "On the Adulteration of Medicines, Chemicals, Drugs, etc., by Dr. R. O. Currey," which will do good by awakening the attention of druggists and physicians to the subject. We are glad when reports of this kind represent the *actual* state of the drugs in the United States. Not what has been, but what is. Any dictionary of adulterations will show the former. Nothing but a watchful scrutiny on the part of qualified physicians and apothecaries will detect the latter.

The Amazon and the Atlantic Slopes of South America. Being a series of letters published in the National Intelligencer and Union newspapers, under the signature of "Inca." By M. F. Maury, LL.D., Lieut. U. S. Navy. Revised and corrected by the Author. Washington: published by Franck Taylor, 1853. pp. 63, octavo.

Lieut. Maury in the above pamphlet has undertaken to show that the Atlantic Slopes of South America, which include the vast basins drained by the Amazon and the La Plata, and their tributaries, constitute one of the most remarkable regions of the globe, viewed in relation to its geological formation, the immense extent of its water courses, the amazing fertility and productiveness of its soil, the delightfulness of its climate, and its admirable adaptation to support a numerous population. Being to a large extent intra-tropical, and constantly irrigated by the never ceasing equatorial currents blowing from the ocean, its seasons are perpetual. The fact that these rivers are navigable for thousands of miles, even into Bolivia, Peru, Eucador, and Venezuela, through their main trunks and branches, at once exhibits their immeasurable capabilities for commerce, when, like our own western waters, they shall have become the pathways for the never-tiring steamer. The object of Lieut. Maury, in delineating the extraordinary features of this vast garden wilderness, is to prove the propriety, nay even the necessity, of the great maritime and commercial powers of the North combining their influence to compel the Brazilian government to abandon its "dog-in-the-manger" policy, by which this vast region is sealed against foreign traders, at the same time that its own subjects are not encouraged to develope its resources. In 1851 the Government of the United States dispatched Lieuts. Herndon and Gibbon to Peru and Bolivia to descend the head waters of the Amazon, flowing through those countries to the main stream and thence to the ocean, to examine their capacity for internal navigation, and also the agricultural and commercial capabilities of the country adjacent. The former has returned after a most tedious and laborious voyage, mostly in canoes, of 3600 miles, and has been since engaged in preparing his report for the press. The latter officer is yet on his perilous journey. When Lieut. Herndon's Report (of which 10,000 copies were ordered by Congress,) comes to hand, we shall have the testi-

mony of an eye-witness qualified to observe; meanwhile the letters of Lieut. Maury have called attention to the vast resources of the forest, the fields, and the rivers, which the magnificent wilderness of the Amazon is ready to pour forth at the demand of commerce, just as the La Plata is commencing to do since the exclusive policy of Rosas has ceased to bar access through it to the beautiful banks of the Parana and Paraguay, which more than a thousand miles from the ocean are navigable to the craft of the enterprising trader. The following extract from the work, in reference to the Ipecacuanha country, will be read with interest:

"Villa Maria is in the midst of the great ipecacuanha region of Matto Grosso. In 1814, Francisco Real was sent to explore the diamond region of this province. But it turned out with him as I apprehend it would turn out with the pioneers of commerce now: as rich in diamonds as are the streams and gravel beds of this province, the riches of the vegetable were found greatly to exceed those of the mineral kingdom.

"This immmense natural plantation includes within one field, 3000 square miles. The crop is perennial, and may be gathered the year round. One expert hand may collect fifteen pounds of this root in a day, which brought in Rio one dollar the pound. The work of an ordinary hand is five pounds the day, and the cost of laborers from $3.40 to $4 per month.

"Castelnau estimates that, from 1830 to 1837, not less than 800,000 pounds of this drug were exported from this province to Rio. This abundant supply brought down its price. But here is the singular feature of this trade: the produce is taken from the very banks of one of the noblest rivers in the world, and transported by mules for the distance of 1,200 miles to the sea coast, in spite of Nature's great highway.

"The ipecacuanha delights in flat or sandy soil, and is found also in great abundance on the banks of the Vermilho, the Seputuba and the Cabacal. Vanilla is also abundant. Its price, when Castelnau was at Villa Maria, was sixty cents the pound.

"But I intend to follow this interesting traveller up into the diamond country, and with him to visit the 'divide' between the waters of the Paraguay and the Tapajos.

"Ascending the Cuyabá, which is the principal Brazilian tributary to the Paraguay, about 150 miles from its mouth, you come to the flourishing city of Cuyabá, the capital of the province of Matto Grosso. It has a population of about 7000. It carries on a brisk commerce with Rio by caravans, numbering from 200 to 300 mules each. This commerce consists of hides, jaguar and deer-skins, gold dust, diamonds, ipecacuanha, and the like. The freight to Rio is $15 the 100 pounds.

"Here, perhaps, among all the wonderful things that are found in these great river-basins of South America, is the most wonderful of them all—a city, the capital of a province larger than all of the 'old thirteen States' of this confederacy put together, and occupying on the banks of [a tributary of] the La Plata very nearly the relative position which St. Louis oc-

cupies on the banks of the Mississippi, carrying on its commerce, not by steam and water, but by the mule load, and over such a distance from the sea coast, that the time occupied by each caravan in going and returning is from ten to twelve months.

"That this state of things should, in the middle of the 19th century, be found to exist in the middle of South America, upon one of the finest steamboat water courses in the world, whose navigable tributaries are owned by no less than five separate and independent nations, and which the 'policy of commerce' has not yet been demanded to be thrown wide open to navigation and commerce, will, in after times, be regarded as more wonderful than any other reality of this wonderful region.

"Nay, Brazil has, within a stone's throw of this very capital, and by easy portage, the navigable waters of her own Amazon; and yet so fearful has she been that the steamboats on those waters would reveal to the world the exceeding great riches of this province, that we have here re-enacted under our own eyes a worse than Japanese policy, for it excludes from settlement and cultivation, from commerce and civilization, the finest country in the world. The Atlantic slopes of South America form a country which is larger than the continent of Europe, in which there is an everlasting harvest of the fruits of the earth."

Written originally for the columns of a newspaper, the letters of Lieut. Maury are not marked with that accuracy and precision of language that might be looked for from so eminent a source, as it is by no means difficult to point out errors of fact as well as of inference, nor can it be disguised that an exaggerated expression characterizes his pages; yet with so glorious a theme anonymously expatiated upon, we can well excuse these lesser defects in the interest he excites, and for the truly national and liberal spirit he exhibits.

Principles of Organic and Physiological Chemistry. By CARL LÖWIG, M. D., Ph. D., Ordinary Professor of Chemistry at the University of Zurich, &c. Translated by DANIEL BREED, M. D., of the U. S. Patent Office. Philada., A. Hart, 1853: pp. 481, oct.

After having looked over this volume, and read parts of it with attention, we acknowledge ourselves gratified with the work as a valuable accession to our chemical literature, and not the less so that the agent to whose industry we owe it, is one of our countrymen. Dr. Breed, during his sojourn in Europe, studied first at Giessen with Liebig, and afterwards with Löwig at Zurich. Whilst in constant intercourse with the latter, he conceived the idea of translating his "Principles of Organic and Physiological Chemistry," and executed a large portion of it. Notwithstanding the complex nomenclature and the numerous formulæ which made it a work of great difficulty, we believe the translator has been unusually successful in rendering the original into English. The book, in its style of execution, is creditable to the publisher. Let us now take a glance at its contents, and see

what Dr. Löwig has to say that can be compressed into the small space we can devote to him.

The "Principles" may be looked upon as an introduction to the "Chemistry of Organic Combinations," (an octavo of 3000 pages) which is now passing through its third edition, and is intended to explain more fully the author's views of the Philosophy of Organic Chemistry. The work is in two parts; the first treating of the constitution and formation of organic compounds, and the Theory of Radicals; whilst the second describes individual substances as classified by the author. The numerous observers and the great accumulation of facts relating to organic substances, render more comprehensive and simple generalizations necessary to classify harmoniously the phenomena of organic combinations, and to develope the laws which control their specific and complex affinities into a natural and truly philosophical system of arrangement. The work of Dr. Löwig is an attempt of this kind. He is a warm advocate of the theory of radicals, and has endeavored to harmonize the prominent facts in Dumas' doctrine of substitution and the theories of types and of nuclei of Laurent and Gerhardt therewith.

If the formula of an organic compound gives merely the sums of its elements as $C_8 H_8 O_4$ in acetic ether, it is called *empirical*. If it groups the the atoms as they are proximately arrranged, as $C_4 H_5, O + C_4 H_5, O_3$ it is then called *rational*, because it explains both the ultimate and proximate composition of the ether and acetic acid.

An organic (or compound) radical is a group of atoms combined, so as to act as a simple element in a series of compounds, of which it forms the characteristic ingredient. Thus, nitrogen in the five oxides of nitrogen, is a simple (*in*organic) radical; whilst ethyl, $C_4 H_5$, is an organic radical, because the oxygen of its oxide, ether, may be replaced by chlorine, bromine, iodine etc., just as though it was a simple body, and belongs to the *primary* class. A second series results when the hydrogen of the radical is partially or wholly replaced by other elements; as when acetyl $C_4 H_3$ becomes chloracetyl $C_4 Cl_3$ by the *substitution* of chlorine; or when valeryl $C_{10} H_9$ becomes $C_{10} H_7 Cl_2$. Such are called *derived* radicals. Owing to this law of substitution the derivative compounds are extremely numerous, yet, as a certain mutual relation exists among substances traceable to a common primary radical, they constitute a natural group or family. It frequently happens that two radicals unite to form a more complex one; in such cases the combining capacity is generally determined by but one of them, in which case the indifferent body is called the *pairling*, the other the *active molecule;* thus $(C_4 H_2)\frown C_2 H$, in which $C_4 H_2$ is the pairling. The following extract will exhibit the author's view of the constitution of the most extensive or hydrocarbon class of radicals.

"By far the greater number of organic compounds are to be traced back to radicals which consist of carbon and hydrogen, and were called above *Hydro carbyls*. By an accurate observation and comparison of these in every aspect which they present, it is found that they belong to different groups,

and that those of each group mostly form an ascending series, in which each successive member contains the same number of carbon and hydrogen atoms as the preceding. But whilst the radicals of one group, in their combining proportions, are allied to hydrogen and the positive metals, those of another agree in this relation with the negative.

In all the radicals of the hydro-carbyls may be distinguished, 1. *The Active Element or Molecule:* and 2. *The Ascending Passive Component*, by which individual members of a group are formed. *In all Organic Radicals which have a positive character*, the active part *is H: in the Negative* C_2H. *The ascending passive member of the Component is always* C_2H_2. All radicals which appear as simple combinations of the components C_2H_2, with the active H, or C_2H, form the class of the *Hydroisocarbyls*, but if between the ascending C_2H_2 and the active H or C_2H, another molecule of carbon enters=C_2,C_4,C_6,C_8, which may be considered as a *Nucleus*, we thus obtain the *Hydropolycarbyls*."

The chapter on the formation of organic compounds possesses much interest. The formation of organic compounds occurs, either by the decomposition of *inorganic* compounds, 1st, by the vital action of plants with the co-operation of light; and 2d, by strictly artificial chemical means;—or it arises from the decomposition of *organic* compounds; either by 1st, electrical influence; 2d, by the effect of heat; 3d, by fermentation and putrefaction; 4th, by the vital functions of the animal organism;—or by the agency of chemically reacting matter. The following quotations from pages 42—45, will repay the reader.

"The inorganic materials for the formation of organic compounds under the influence of the vitality of plants, are carbonic acid, water and ammonia. As is known, the lower plants, as the fungi, consist of single cells, each of which represents the plant itself; by the union of these cells the cellular tissue of the higher plants is formed. These cells are the most important organs of plants; in them, under the action of the sunlight, and particularly of the yellow and green rays, the formation of the organic compounds takes place. The green parts of plants, particularly the leaves, possess the power of decomposing water and the carbonic acid of the air; consequently overcoming the original affinities by which the elements in these combinations are united, and of uniting the carbon of carbonic acid with the hydrogen of water, to form organic radicals or molecules, which either combine with each other, or unite with one part of the oxygen withdrawn from carbonic acid and water, whilst the other part escapes into the atmosphere. In most cases the volumes of oxygen gas set free are equal to the volumes of carbonic acid absorbed by the plants; and if this, in the formation of certain organic compounds, is not the case, yet the result in the entire vegetable kingdom will agree with the above. Plants prevent the accumulation of carbonic acid in the air, and mainly cause the atmosphere to remain the same. It is true the leaves absorb oxygen during the night, and evolve carbonic acid; yet the parts of plants not green receive oxygen by day and night, and thence give forth carbonic acid. But the quantity of oxygen gas which the plants use in the formation of carbonic acid, is much less than that which the green parts of the same emit by day. If the constituents of ammonia, which by continual decomposition of animal matter arises in great quantities, take part at once in the formation of organic compounds, so arise nitrogenous organic radicals. A part of the material which is necessary to the existence and growth of plants, they also obtain from the residue of organic matter already attacked by decomposition, without previous formation of

carbonic acid and ammonia. The compounds which are formed in plants, suffer, during the growth of the latter, continual changes, as well in physical as in chemical relation. The ascertaining of the conditions under which the formation of organic matters in plants occurs, as well as the changes in the same which they continually undergo, is the object of the physiology of plants, and this is the basis of rational agriculture.

Without the influence of the vitality of plants, as yet, only a few organic compounds can be produced; and it was believed, until recently, that organic bodies could only be formed through the inherent vital powers of plants. This view is completely refuted by the new researches in the province of organic chemistry, since chemists have succeeded in producing artificially complete organic combinations out of inorganic matter, and precisely such as occur in plants and animals. Thus, if sulpho-carbonic acid CS_2 and chlorine be led through a glowing porcelain tube, chloride of sulphur arises, and also a combination which consists of $C_2Cl_4 = (C_2Cl)Cl_3$. If this compound be again led through a glowing tube, it decomposes into chlorine and $C_4Cl_6 = (C_4Cl_3)\,Cl_3$. If we treat these bodies with potassa, we obtain 3 atoms chloride of potassium, and $C_4Cl_3O_3$, or chloracetic acid; and if we let 6 atoms potassium and 3 atoms HO act upon this, we obtain 3 atoms chloride potassium, 3 atoms KO, and 1 atom acetic acid $= (C_4H_3)O_3$. By the action of chlorine upon sulpho-carbonic acid, under water, we obtain a volatile crystalline body which may be considered as consisting of $C_2Cl_4, 2SO_2$. If this compound be overflowed with a solution of potassa, we obtain a potassa salt of an acid which consists of C_2Cl_3, S_2O_5, and if this be exposed to the current of a two-piped zinc and coal battery, by the presence of water, the chlorine is gradually replaced by hydrogen, and thus compounds are formed which consist of C_2HCl_2, S_2O_5, C_2H_2Cl, S_2O_5 and C_2H_3, S_2O_5. The substance C_2H_3 is methyl, which occurs in combination with oxygen in the oil of *Gaultheria procumbens*. If, over a mixture of carbon and carbonate of potassa, heated to redness, we lead nitrogen gas, we obtain cyanide of potassium K,NC_2; cyanogen with hydrogen gives hydrocyanic acid; hydrocyanic acid and water, by alternate decomposition, form formic acid and ammonia. Heated potassium, with oxide of carbon, gives a compound which, by being dissolved in water, forms rhodizonate of potassa, and which then again separates into carbonate and croconate of potassa. Many similar formations of organic compounds out of inorganic material are known.

As has been repeatedly shown, the individual elements in the organic compounds are not united with each other in accordance with their original affinities, and the combinations owe their greater or less permanency to the greater or less chemical opposition which the organic radicals present to the materials combined with them. If this opposition be considerable—that is, if the affinity of the radical to the materials combined with it is slight, and compounds of distinguished chemical character may arise by the transposition of the individual atoms of the radical, then a great tendency to decomposition is present, and inconsiderable outward circumstances are sufficient to cause it. This inclination to the formation of compounds with marked characters, often overpowers the greatest affinities, as is the case in the forming of organic combinations from carbonic acid and water by the vital functions of plants.

If the individual atoms of compound molecules unite in other proportions to form new radicals and combinations, in which the individual components present mutually a greater chemical opposition, then the formation of these radicals and compounds results from *transposition*. If in the new compounds twice the number of elementary atoms occur as in the original, polymeric or metameric bodies are formed with them. Thus aldehyd $C_4H_4O_2$ changes into metaldehyd $C_{12}H_{12}O_6$, bitter almond oil $C_{14}H_6O_2$ into

benzoin $C_{28}H_{12}O_4$. But when the original affinities of the elements overpower the chemical character of the compounds, decomposition commences by the separation of inorganic matter. The same is complete if all the individual atoms of the compound radicals are led over into inorganic combinations. By this entire decomposition every trace of organization is destroyed. On the other hand, if the decomposition be only partial, if only individual atoms leave the organic radicals, then at once the formation of new radicals and compounds of the same takes place. Thus from ethyl C_4H_5, by loss of H_2, acetyl C_4H_3 arises; if from acetyl C_2 departs, we obtain methyl C_2H_3; again, if methyl lose H_2 it goes over into formyl C_2H.

The number of new compounds which may arise by partial decomposition is proportionate to the number of single atoms of which the organic radical consists, and the grade of the order to which the compound belongs. Substances which consist only of carbon and hydrogen are generally unchangeable; but if oxygen be united to hydrocarbyls and their original affinity for the elements of the radical be called out by any means, then will this cause the decomposition by forming carbonic acid or water, or both together. In all organic compounds containing oxygen, the atoms of carbon and hydrogen in the radical preponderate over the atoms of oxygen; hence also, by granting that the oxygen atoms, combined with the radicals, instantaneously receive as many individual atoms of carbon and hydrogen as are necessary to the formation of carbonic acid or carbonic acid and water, there must at once follow a separation of carbon or hydrocarbon. An instantaneous withdrawal of all the oxygen atoms never takes place, for in proportion as single atoms of carbon and hydrogen are absorbed, new radicals arise which possess affinity for the yet present oxygen, which by the original affinity of the latter must be again overcome. In combinations of a higher order, the decomposibility is mainly dependent upon the opposite chemical properties of the proximate constituents; the stronger these properties appear, the firmer are their combinations; but the less their mutual attraction is, the more complex these combinations are, the more do the single atoms seek (mainly through separation of carbonic acid and water, and in the nitrogenous of ammonia also) to unite, forming firmer and less complex compounds. To this class of substances the common constituents of the vegetable kingdom directly belong, and particularly those of the animal organization.

We have not space to dwell on the special part of the work. The following classification is adopted, viz:

1st. Hydrocarbyls, including the *hydroisocarbyls* and *hydropolycarbyls;* the first embracing the methyl and formyl groups of radicals and their derivatives. The second comprehending four groups of radicals founded on the size of the carbon nucleus. The fifth group including the volatile oils, camphors, resins, etc.

2d. Carbyls are hypothetical radicals consisting of two or more atoms of carbon, and are peculiar to Dr. Löwig. *Oxatyl* C_2 is the radical of oxalic acid, and is a type of the class which includes most of the ordinary vegetable acids.

3d. Azocarbyls include cyanogen and its compounds and three analogous radicals.

4th. Hydroazocarbyls comprise the *uren* compounds and the *alkalids*, of which glycocoll is a type.

5th. HYDRILS embrace the organic alkaloids, artificial and natural, and those radicals containing metals as Kakodyl, Stibmæthyl, etc.

6th. COMPLEX ORGANIC SUBSTANCES, *non-nitrogenous*, as tannic acid, bitter neutral principles, the starchy, ligneous and gummy and saccharine substances, coloring matters, etc., and *nitrogenous*, as protein substances, gelatin, animal tissues, etc.

7th. *Products of decomposition*, as ulmin, humin, etc.

In the forgoing sketch of the "Principles of Dr. Löwig, the reader may see how far he is disposed to carry the Theory of Radicals, but the book should be read to appreciate his reasons and to ascertain on what kind of evidence his hypotheses are erected. In the incipient state of all exact sciences, hypotheses must be employed; they are the scaffolding of the future system; yet the true philosopher carefully keeps in view their auxiliary nature, and avoids confounding them with ascertained truth. We advise every chemical student to read the book carefully, as it will amply repay the time so devoted, and suggest many trains of thought of use in his course of study.

Elements of Chemistry; for the use of Colleges, Academies and Schools. By M. V. REGNAULT. Illustrated by nearly 700 wood cuts. Translated from the French by T. FORREST BETTON, M. D., M. A. N. S., Fellow of the College of Physicians, Philada, &c., and Edited, with notes, by JAMES C. BOOTH, Melter and Refiner, U. S. Mint, and WILLIAM L. FABER, Metallurgist and Mining Engineer. Second edition: Philada., Clark and Hesser: 1853. 2 vols. oct. pp. 1475.

Chemistry has become an all-pervading power in the economy of modern civilization; the universal hand-maiden to the arts and sciences. There are none of these so refined, so abstract or so practical, that it cannot lend its aid. It is the grand solver of knotty problems—the umpire appealed to when difficulties beset the artist and manufacturer, and in proportion as it has been cultivated, has the material progress of nations advanced. As the developer of natural resources, chemistry peculiarly addresses itself to the American people. With priceless hoards of natural wealth stored away in our mountains and vallies, with a soil and climate embracing the whole range of temperate and many tropical productions, with a people full of energy and enterprise, and demanding its employment, the United States of America should encourage the cultivation of practical chemistry by National and State patronage. The right time may not have come; yet the Government should look forward to the establishment of a National polytechnic school, wherein chemistry as a practical science should be thoroughly taught by the best teachers that a liberal remuneration will draw from our own or the laboratories of Europe; and at a price to students that would open its doors to that extensive class of young men whose means are limited, yet whose intellectual longing and talents induce to aim at a career of higher usefulness.

These reflections have been called up by glancing over the work of M.

Regnault, who, though young in years, is experienced in the paths of chemical philosophy, and a bright star among the savans of Paris. The original is in four duodecimo volumes. In its American dress the work is comprised in two large octavos. The letter press is larger and more comfortable to the eyes than the original; the numerous excellent illustrations in the latter are well copied, and altogether it is highly creditable to the publishers. The translator has executed his part thoroughly; no gallicisms or obscure phrases have been noticed. The Editors appear to have given due attention to the proof sheets. They have very properly introduced Fahrenheit numbers for temperature, and the hydrogen scale of equivalents, and with equal propriety have retained the decimal weights and measures of the original. Besides, they have added numerous foot notes, either explanatory of the text or in relation to recent observations. Several of these are valuable additions. Let us now look into the book a little closer, and see in what respect M. Regnault claims merit as a chemical writer. The first feature that strikes one is the absence of the chapters, usually preliminary in English chemical books, on the chemistry of the imponderables. The introductory chapter of 78 pages, after explaining the divisibility of matter, aggregative and chemical affinity, and the law of multiple proportion with chemical nomenclature and symbols, is chiefly devoted to a very lucid account of crystallography, copiously illustrated with wood cuts, in which the several systems are explained. This chapter will prove very useful to the student, as the importance of crystalline form, both in natural and chemical bodies, as a distinctive characteristic, is yearly increasing.

The general classification of the elements is as metalloids and metals. The whole work exhibits an unusual tendency to *apply* chemical facts to the arts, and in the description of processes it is apparent that the author is thoroughly conversant with what he describes, distinguishing which are the best, and why: again, he brings in many facts and phenomena just in the place they are naturally called up in the progress of the work:—for instance, under water, the several physical facts regarding its congelation, vaporization, condensation and solvent power, usually spoken of under caloric, are noticed. Whilst the principle of the safety tube and Woulf's apparatus, and the theory of volumes, are brought in under the compounds of nitrogen. The best modes of determining and separating many substances are specially stated, and a recapitulation of important chapters, as those of the compounds of oxygen with nitrogen, sulphur and phosphorus, is appended, of much use to the student. We observe that arsenic is placed among the non-metallic bodies along with phosphorus; and oxalic acid, cyanogen and hydrocyanic acid under carbon.

In the remarks preliminary to the metals, a considerable space is devoted to the geological structure of the earth and of metallic veins, illustrated with cuts. The physical properties of the metals, their chemical properties and relations to oxygen and other metalloids, and their alloys, are there noticed; and finally, a most interesting chapter on the general characters and formation of salts. M. Regnault gives as the definition of a salt, "every combi-

nation of two binary compounds, one of which acts the part of an electro-positive element or base, and the other of an electro-negative element or acid," thus throwing out from this category the so-called haloid salts and other binary compounds. The solubility of salts is largely spoken of and illustrated, and their behaviour under chemical treatment exposed, as regards classes.

The chemistry of the alkaline, alkalino-earthy, and earthy metals and their compounds is much enlarged on as regards potassium, carbonate and nitrate of potassa, chloride of sodium and carbonate and borate of soda, ammoniacal salts, chlorinated lime, etc., with an appendix of nearly 100 pages on gunpowder, with the details of its manufacture, testing and analysis, building materials and cements, analysis of limestones, the glass manufacture in its several varieties, pottery ware, including porcelain and stone ware, etc.

The second class of metals, including all that can readily be kept in dry air, are next described, preceded by a chapter on the mechanical preparation of ores, illustrated with cuts. In the description of these metals, the author has introduced an account of the metallurgy of the principal ones, as iron, zinc, tin, lead, bismuth, copper, antimony mercury, silver, gold, etc. Among the special notices, are the steel and wire manufacture, testing of iron ores, bronze cannon casting, assaying of silver, galvanic silvering and gilding, etc. Prof. Booth gives the process of refining gold at the U. S. Mint, by alloying with silver, and parting with nitric acid, etc., by which $800,000 worth of gold is refined in four days.

The fourth part is devoted to organic chemistry, the introduction to which treats of Proximate and Elementary organic analysis, the establishment of formulæ, the determination of acid, basic, and neutral substances, the determination of the specific gravity and other properties of the vapors of organic volatile bodies, and the analysis of gases; the two last being very elaborate.

The author treats first of the ligneous, amylaceous, gummy and saccharine substances; then of their products with acids and under the influence of fermentation by which alcohol, ether, the compound ethers, acetic, butyric and lactic acids, &c., are included. M. Regnault was not an advocate for the radical theory, at the time he wrote on this subject. What influence Frankland and Kolbe's recent isolation of ethyl, amyl, valeryl, etc., has had on his opinions, we are not aware. Mr. Faber has given the recent discoveries of this character in several copious notes.

The vegetable acids and alkaloids, the essential oils, and the resins follow. In this connection Prof. Booth very properly refers to the important discovery of the vulcanization of Caoutchouc by our countrymen, C. Goodyear, which is not noticed in the text. The empyreumatic, fatty and coloring substances, are next spoken of; then the chemistry of animal substances, the work concluding with notices of important manufactures of organic matter, including bread, brewing, cider, wine, beet sugar, cane sugar, bone black, tanning, charcoal making, and the gas manufacture.

The Action of Medicines in the System; or "On the mode in which Therapeutic Agents introduced into the Stomach produce their peculiar effects on the Animal Economy." Being the Prize Essay to which the Medical Society of London awarded the Fothergillian Gold Medal for 1852. By FREDERICK WILLIAM HEADLAND, B. A., M. R. C. S., &c. Philadelphia: Lindsay & Blakiston, 1853, pp. 360.

There are few subjects weighted with greater difficulties than the one discussed by the author in the volume before us. Tracing the effects of a single medicine after its introduction into the system, involves so many observations under obscure circumstances, that the most favorable results give but a very partial insight into the actual happening that has taken place. At best, therefore, the therapeutist can but approximate to the real history of the course of action of medicinal agents after their introduction into the stomach; yet so numerous have been the observers, so interesting is the subject, and so important are deemed the facts to the progress of rational medicine, that the accumulation of observations justify an attempt at generalizing. The work of Dr. Headland is such an one, and that it has been deemed a successful one the award of the London Society stands in evidence.

The author has arranged his views in ten propositions, (which we have not space to present to the reader,) to the support of which he brings numerous facts and arguments. The work possesses much interest, and should be studied carefully by every physician who would keep himself posted up in the literature of his profession.

A Treatise on General Pathology by Dr. J. HENLÉ, *Prof. of Anatomy and Physiology in Heidelburg.* Translated from the German by H. C. PRESTON, A. M., M. D. Philada.: Lindsay & Blakiston, 1853. pp. 390. Octavo.

The translator has a high opinion of the merits of the author "as a distinguished medical teacher, and the best modern pathological author." The corroboration of the latter assertion we leave to the physician; yet if his translator has done him justice, we fear Dr. Henlé's style of writing is too vague and *un*perspicuous to render his learning profitable to his readers.

OBITUARY.—Our last number contained an account of an act of munificence on the part of M. Orfila, by which several scientific bodies of France received donations, and which was effected on the 1st of January. It now becomes our duty to record the death of this great Toxicological Chemist and Philosopher, who died on the 12th of March, in his 70th year. A Spaniard by birth and education, he early went to Paris, in which city his great reputation as a teacher and investigator was made. Orfila was one of the Editors of the "Journal de Chimie Médicale," and the author of several works; yet that on Toxicology is perhaps the one upon which his reputation most depends. As a lecturer he was fluent, witty and full of anecdote, using a great variety of experimental illustrations; and being, in the words of Mr. Ince, "the *beau ideal* of a popular man," his lectures were well attended.